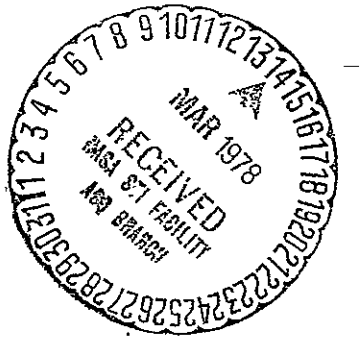
THE NIMBUS 6 DATA CATALOG
VOLUME 9

1 NOVEMBER 1976 THROUGH 31 DECEMBER 1976

DATA ORBITS 6803 THROUGH 7619

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GODDARD SPACE FLIGHT CENTER

GREENBELT, MARYLAND

THE NIMBUS 6 DATA CATALOG

Volume 9

1 November 1976 through 31 December 1976
Data Orbits 6803 through 7619

Prepared by

Management and Technical Services Company
Beltsville, Maryland

For the

Landsat/Nimbus Project

November 1977

GODDARD SPACE FLIGHT CENTER
Greenbelt, Maryland

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FOREWORD

This is the ninth volume of a series of catalogs to be published by the National Aeronautics and Space Administration to document data acquired from the Nimbus 6 meteorological satellite. This volume covers the period from 1 November 1976 through 31 December 1976. Subsequent catalogs will contain documentation for succeeding periods throughout the useful lifetime of Nimbus 6.

Background information concerning the Nimbus 6 meteorological satellite system and a description of the experiments and data formats has been published separately in The Nimbus 6 User's Guide. Post-launch User's Guide information changes and corrections are included in the data catalogs. The Nimbus 6 catalogs present the type of data available, anomalies in the data, if any, and geographic location and time of the data.

The assembly and editing of this catalog was accomplished by the Management and Technical Services Company (MATSCO), Beltsville, Maryland, under contract number NAS5-23740 with the Goddard Space Flight Center, NASA, Greenbelt, Maryland.



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SECTION 1

SUMMARY OF OPERATIONS

1.1 Introduction

Nimbus 6 was successfully launched from the Western Test Range, Vandenberg Air Force Base, California at 08 hr. 12 min. 00 sec. GMT on 12 June 1975. The orbit was nearly circular at 1093 x 1105 km. Satellite operations from launch through 14 July (orbit 425) consisted of engineering evaluation of all spacecraft systems. As a result of that effort, data reception, accountability and processing were intermittent during that period. Therefore, Volume 1 in this catalog series mainly reflects documentation from orbit 426 (14 July) through orbit 1082 (31 August). During orbit 4905 (12 June 1976) Nimbus 6 successfully completed one year of operations. Table 1-1 is a summary of the documentation for each Nimbus 6 Data Catalog volume.

Because the spacecraft power is limited, all experiments are not on at the same time. During this catalog period the THIR*, ESMR, ERB, PMR and TWERLE/(Random Access Measurement System) were recorded for almost all orbits. The exception to this schedule took place during 7 through 9 December when the T&DRE experiment was on, while the ESMR was off, and again from 12 through 15 December when the ESMR resumed full-time operations. ESMR data quality from both Horizontal and Vertical channels was good through orbit 6183 (15 Sept.). After orbit 6184 (15 Sept.), the Horizontal channel output went to zero and telemetry information indicates a failure of the Ferrite Dicke switch. The Vertical channel remains in good working order with data being collected and processed. These data are being used in the analysis of hurricanes and tropical storms. The SCAMS instrument functioned through orbit 4751 (31 May 1976); after the above

*THIR sensor restarts - orbit 6809 (1 Nov.)

Table 1-1

Nimbus 6 Catalog Documentation Summary

Volume	Dates	Orbits
1	12 June 75-31 Aug. 75	1-1082
2	1 Sept. 75-31 Oct. 75	1083-1900
3	1 Nov. 75-31 Dec. 75	1901-2717
4	1 Jan. 76-29 Feb. 76	2718-3521
5	1 Mar. 76-30 Apr. 76	3522-4338
6	1 May 76-30 Jun. 76	4339-5155
7	1 July 76-31 Aug. 76	5156-5985
8	1 Sept. 76-31 Oct. 76	5986-6802
9	1 Nov. 76-31 Dec. 76	6803-7619

mentioned date, the SCAMS instrument ceased to function due to a scan mechanism anomaly, see Section 5.3 this catalog. The HIRS instrument failed during orbit 4697 (27 May) when a filter chopper motor anomaly occurred. As a precautionary measure, the HIRS subsystem was turned off. Due to the depletion of methane in the cryogenic cooler, the last useable data from the LRIR experiment was received during orbit 2801 (7 January 1976). The on-off cycle for each experiment is shown in Table 2-2 in Section 2 of this catalog.

Because of an anomaly in the functioning of the High Data Range Storage subsystem (HDRSS) B, first noted during orbit 33 (14 June), HDRSS B has been limited to 65 minutes of record capability (out of a possible 120 minutes). With only HDRSS B available for full-time use, there are occasional periods when global experiment coverage is not obtained. (These occur when the Orroral, Australia STDN station is not available for playback of recorded experiment data.) The areas not covered are usually over the western part of the Pacific Ocean and/or the eastern part of the Atlantic Ocean. During orbit 4641 the HDRSS A recorder failed to record. Prior to the above date, HDRSS A was successfully used operationally 120 minutes every other orbit with HDRSS B providing 65 minutes of alternate coverage. Complete failure of HDRSS A occurred during orbit 4713 and despite many attempts to engage the system in a record mode, it has not recorded since orbit 4713 (28 May). The areas most affected by the lack of HDRSS A experiment coverage are the latitudes north of the Equator during the nighttime orbital passes. The daytime coverage remains virtually unchanged with the exception as noted in the above paragraph.

The pitch of the Nimbus 6 satellite has been made to alternate between +2.0 degrees, +0.6 degrees, and 0.0 degrees since launch. Table 1-2 lists the orbits when each pitch position was used.

A positive pitch angle of 0.6 degrees moves the nadir-looking position 11.5 kilometers ahead of the subsatellite point. A positive pitch angle of 2.0 degrees moves the nadir-looking position 38.3 kilometers ahead of the subsatellite point.

At these pitch angles, a scanner-type instrument no longer scans the earth along a great circle arc through the subpoint, but scans along the small circle formed by the intersection of the scan plane with the earth. Since the plane of the small circle is tilted with respect to the nominal scan plane, points on the arc are displaced farther from the great circle as the scan angle increases. As noted above, a pitch angle of 0.6 degrees causes a displacement of 11.5 kilometers at nadir, but when the scanner turns 45 degrees away from nadir the displacement increases slightly to 12.8 kilometers. Similarly, for a 2.0 degree pitch the displacement is 38.3 kilometers at nadir and increases to 42.6 kilometers at a 45 degree scan angle. Thus, although the instrument records in lines normal to the orbit plane (in the absence of yaw) the perpendicular displacement from the perfect-attitude scan line is not uniform across the scan line.

Subsections 1.2 through 1.10 of this catalog summarize the operational highlights of the individual experiments, present preliminary experiment results, and call

Table 1-2

Pitch Positions for Nimbus 6
01 November 1976 through 01 January 1977 (Orbits 6807-7632)

Pitch Change			Pitch Bias	
Date (1976)	Orbit and STDN	Time (GMT)	+0.6°	+0.0°
1 Nov	6807A*	0831		X
1 Nov	6801A	1349	X	
1 Nov	6811A	1527		X
4 Nov	6855A	2216	X	
5 Nov	6859R*	0548		X
6 Nov	6882A	2240	X	
7 Nov	6884A	0332		X
8 Nov	6908A	2117	X	
9 Nov	6912A	0443		X
11 Nov	6947A	1911	X	
12 Nov	6951W*	0230		X
13 Nov	6976O*	0025	X	
13 Nov	6979R	0453		X
16 Nov	7014A	1915	X	
17 Nov	7018R	0337		X
18 Nov	7038A	1427	X	
18 Nov	7038A	1428		X
19 Nov	7056A	2228	X	
20 Nov	7059R	0417		X
22 Nov	7096A	2209	X	
23 Nov	7098O	0257		X
29 Nov	7189A	2052	X	
30 Nov	7191O	0149		X
2 Dec	7219W	0248	X	
2 Dec	7221R	0634		X
3 Dec	7232R	0208	X	
3 Dec	7233R	0407		X
4 Dec	7245O	0235	X	
4 Dec	7248R	0658		X
6 Dec	7278A	1232	X	
7 Dec	7290A	1003		X
7 Dec	7296A	2038	X	
8 Dec	7305A	1258		X
8 Dec	7311W	2343	X	
9 Dec	7316A	0842		X

Table 1-2 (Continued)

Pitch Change			Pitch Bias	
Date (1976)	Orbit and STDN	Time (GMT)	+0.6°	+0.0°
10 Dec	7333A	1504	X	
10 Dec	7333A	1504		X
12 Dec	7352O	0213	X	
12 Dec	7355R	0643		X
13 Dec	7377A	2145	X	
13 Dec	7379O	0234		X
14 Dec	7390A	2104	X	
15 Dec	7393O	0340		X
19 Dec	7458A	2257	X	
19 Dec	7461R	0439		X
1 Jan 1977	7632A	2247	X	

*A = Fairbanks, Alaska; O = Orroral, Australia; R = Rosman, North Carolina; W = Winkfield, England

attention to known data anomalies. Section 2 lists the on-off times for each experiment and provides a method for determining the geographical coverage of each experiment. Section 3 shows selected ESMR images, and Section 4 presents THIR montages. Section 5 presents corrections to The Nimbus 6 User's Guide.

The user is referred to The Nimbus 6 User's Guide for a complete description of each experiment and to Section 1.7 of that Guide for the requesting procedure and sources for all data. Sections 2, 3, and 4 of this Data Catalog should help users select data to meet their needs.

1.2 The Temperature Humidity Infrared Radiometer (THIR) Subsystem

The THIR Radiometer mirror anomaly that occurred during orbit 6732 (26 October) has been corrected and operations are back to normal. Data quality from both channels (11.5 μm and 6.7 μm) and telemetry have been good since orbit 6809 (1 November). Daily world montages of the THIR are presented in Section 4 of this catalog. All processed THIR film is archived and available through the National Space Science Data Center, as is all available THIR digital data. The THIR digital products are processed to final format only on request. Users should refer to Section 4 of this catalog, and to Sections 1.7 and 2.4 of The Nimbus 6 User's Guide for a discussion of the formats and procedure to order these products.

1.3 The High Resolution Infrared Radiation Sounder (HIRS) Experiment

During this reporting period, the HIRS instrumentation system did not operate. The last operational data was obtained during orbit 4697 (27 May) when a subsystem anomaly

Filter Chopper motor failed) occurred; causing the sybsystem to be turned off as a precautionary move. Subsequent operations after orbit 4697 are to be construed as evaluations of the subsystem anomaly. Valid operational data is not available after the above date (27 May 1976).

1.4 The Scanning Microwave Spectrometer (SCAMS) Experiment

The instrument ceased functioning during orbit 4751 (31 May) due to jamming of the scan mechanism. Scan problems as discussed in Volume 5 first developed during orbit 3862 (26 March), when the drive belt for channel 2 (31.65 GHz) antenna started slipping. The loss of data from channel 2 prevented retrieval of atmospheric water vapor and liquid water during said catalog period; the inversion matrices for atmospheric temperature were redefined to exclude channel 2, and temperature retrievals were continued until 31 May. (Since this last date, various improvements have been made with respect to data retrieval, calibration of oxygen band channel and inversion of H_2O channels. For a current summary of events as related to SCAMS, see Section 5.3.)

1.5 The Electrically Scanning Microwave Radiometer (ESMR) Experiment

The ESMR performance continued to be satisfactory through orbit 6183 (15 September). After orbit 6184 (15 September), the Horizontal channel output went to zero and telemetry information indicates a failure of the Ferrite Dicke switch. There was no affect on data from the Vertical channel. Data are being collected and processed with the EIS display updated to process only the Vertical channel data. See Section 3 for a new table of values and selected ESMR images for this catalog period.

1.6 The Earth Radiation Budger (ERB) Experiment

The Solar and wide-angle Earth-Flux channels continued to operate in the non-scanning mode. The data quality is good and the ERB sensor is operating full-time as power permits. The scanning channels operate only in the nadir position because of mechanical scan problems.

1.7 The Limb Radiance Inversion Radiometer (LRIR) Experiment

The last useable data from the LRIR was received during orbit 2801 (7 January). By this orbit the methane used to cool the detector was depleted and the telemetry indicating the detector temperature was saturated at 73.6°K. The ammonia temperature was constant until orbit 2787 (6 January) when it began to increase and then became erratic-varying from 145.6°K to 150.0°K. At orbit 2802 (7 January) the temperature of 145.6°K began increasing and by orbit 2806 it was at 165.7°K, when the LRIR was turned off. Since the above date, the experiment has been turned on during several occasions to record the ammonia temperature. The last reading, orbit 5014 (20 June) indicated that the cryogen shield temperature reached telemetry saturation at 263°K. With all of the coolants (Methane-ammonia) depleted and useable experiment data non-existent; the LRIR is expected to be in a permanent non-operational mode even though the instrument and telemetry are completely functional.

1.8 The Pressure Modulator Radiometer (PMR) Experiment

The PMR performance was satisfactory during this reporting period. The instrument was on continuously. Data quality was good.

From orbit 1727 (19 October) through orbit 5526 (28 July), channel 1 operated in the nadir-looking mode. This was necessary because in the scan mode this channel appeared to operate between ±10° from nadir rather than ±15° from nadir. During orbit 5526, channel 1 was enabled for 5 minutes, and 60 minutes during orbit 5594 (2 August). Since orbit 5633 (5 August) channel 1 scan operations have been satisfactory. Data quality from both channels are satisfactory. All acquired data was routinely transmitted from GSFC to the experimenter at Oxford, England.

1.9 The Tropical Wind Energy Conversion and Reference Level Experiment (TWERLE)/ Random Access Measurement System (RAMS)

With the successful conclusion of the TWERL Experiment, data transmission to the National Center for Atmospheric Research was terminated on 10 August 1976. A summary report detailing verious aspects of the experiment has been published and may be found in the following publication authored by: Julian, P., Massnon, M., Levanson, N.: The TWERL Experiment, Bulletin of the American Meteorological Society, vol. 58, no. 9, September 1977, pp. 936-948.

The TWERL Experiment was a significant part of the work load of the Random Access Measurement Subsystem (RAMS). However, the RAMS continues to be used to track and monitor various experiment platforms.

As of 12 June 1976, (Nimbus 6 one year anniversary) over 700 platforms had been activated. Table 1-3 shows distribution of these platforms. The full address of each experimenter is given in Table 9-2 in the Nimbus 6 User's Guide. (Corrected addresses for many of these experimenters, and addresses for several new experimenters, are given in Section 5.8 of this catalog.) Anyone interested in results from a particular experiment should write to the principal investigator for that experiment.

1.10 The Tracking and Data Relay Experiment (T&DRE)

The T&DRE subsystem operations were resumed during orbit 7288 (7 December). Subsystem performance was good through orbit 7378 (13 December) when an anomaly of Y (Pitch) axis gimbal caused the T&DRE to cease operations during orbit 7401 (15 December). For specific on-off time schedules, see Table 2-2, Section 2, this catalog. Significant accomplishments of T&DRE are discussed in Data Catalog Volume 1, Section 1.10.

Table 1-3

TWERLE Platform Activity as of 12 June 1976

Principal Investigator	Platform			
	Type	Active	Inactive	Total
Dr. Paul R. Julian Boulder, Colorado	Balloons	81	275	356
Professor Norbert Untersteiner Seattle, Washington	Ice Buoys	26	6	32
Dr. Hanson Miami, Florida	Drifting Buoys	12	33	45
Mr. Vincent Lally Boulder, Colorado	Balloons	0	21	21
Dr. P. Richardson Woods Hole, Massachusetts	Drifting Buoys	0	1	1
Arnold Gordon Palisades, New York	Drifting Buoys	4	20	24
Tim P. Barnett La Jolla, California	Drifting Buoys	3	13	16
Mr. Robert Kee Washington, D. C.	Drifting Buoys	0	2	2
Mr. R. E. Vockeroth Ontario, Canada	Buoys	2	0	2
Mr. Jack Lentfer Anchorage, Alaska	Polar Bears	1	1	2
Mr. B. M. Buck Santa Barbara, California	Drifting Buoys	3	2	5
Mr. Fernando DeMendonca Sao Paulo, Brazil	Buoys	0	2	2
Mr. George Cresswell Cronulla, Australia	Drifting Buoys	9	5	14
Dr. A. Dyer Mordialloc, Australia	Drifting Buoys	0	3	3
Professor Lacombe Paris, France	Drifting Buoys	1	4	5

Table 1-3 (Continued)

Principal Investigator	Platform			
	Type	Active	Inactive	Total
Mr. C. K. Jenson/J. Nordo Oslo, Norway	Buoys	2	0	2
Mr. T. Haegh/T. Vinje Oslo, Norway	Ice Buoys	5	5	10
Mr. Frank Anderson Congella, South Africa	Drifting Buoys	5	5	10
Professor H. Stommel Cambridge, Massachusetts	Drifting Buoys	0	6	6
Dr. A. D. Kirwan, Jr. College Station, Texas	Drifting Buoys	0	12	12
Mr. H. N. Brann Melbourne, Australia	Drifting Buoys	1	5	6
Professor Morel Paris, France	Balloons & Buoys	0	47	47
Dr. John Garrett Victoria, B. C. Canada	Drifting Buoys	2	33	35
Professor Tchernia Paris, France	Drifting Buoys	3	2	5
Mr. R. R. Dickson Lowestoft, Suffolk, U. K.	Drifting Buoys	1	5	6
Dr. Michael Hall Bay St. Louis, Mississippi	Buoys	9	10	19
Mr. David Thomas, Jr. Hampton, Virginia	Buoys	0	6	6
Dr. J. Williamson La Jolla, California	Balloons	0	1	1
Mr. J. C. O'Rourke Calgary, Canada	Buoys	2	0	2
Mr. Robert Oehlkers Madison, Wisconsin	Buoys	2	8	10
Capt. E. A. Delaney Washington, D. C.	Buoys	1	0	1

Table 1-3 (Continued)

Principal Investigator	Platform			
	Type	Active	Inactive	Total
Dr. R. H. Goodman Alberta, Canada	Buoys	1	1	2
Dr. D. Halpern Seattle, Washington	Buoys	2	1	3
TOTALS		178	535	713

SECTION 2

THE ORBITAL ELEMENTS AND DATA AVAILABILITY ON-OFF TIMES

This section presents the Nimbus orbital elements for selected epochs, tabulates the time when each of the experiments was recording data, and gives procedures for determining the time and orbit when the satellite is over a given geographical area (and thus determining the location of coverage for each experiment).

The Nimbus 6 Brouwer Mean orbital elements for selected epochs during November and December 1976 are listed in Table 2-1.

Since 26 May, the orbital period appears to have stabilized and has remained almost constant at 107.418 minutes. Thus with the depletion of the solid methane and ammonia from the LRIR now complete; the predicted (Vol. 4, Sec. 2) stabilization of the orbital period by mid-1976 has been confirmed. When these elements are used more than seven days from epoch, however, location errors of greater than 60 km (about ten seconds of time), can be expected. If more accurate ephemeris are needed for a specific time period, write to the Nimbus Project, Code 430, Goddard Space Flight Center, Greenbelt, Maryland 20771.

The data availability on-off times, listed in Table 2-2, are the times when the data from each experiment was recorded on a HDRSS and processed through the Meteorological Data Handling System (MDHS) at Goddard Space Flight Center. The Table 2-2 header labels and their meaning are as follows:

- INT ORBIT AND STDN

 The satellite orbit number in progress when the satellite data is relayed to a ground station is called the interrogation orbit (INT ORBIT). The ground stations receiving the Nimbus 6 satellite data are part of the Spacecraft and Tracking Data Network (STDN). There are five STDN stations receiving Nimbus 6 experiment data: Fairbanks, Alaska (denoted by the letter "A"); Rosman, North Carolina (R); Orroral, Australia (O); Winkfield, England (W); and Goddard Space Flight Center, Maryland (E).

- HDRS

 The HDRS (High Data Rate Storage System - HDRSS) is the acronym for the satellite tape recorder system. Recorder "A" or "B" (or both) is played back during each STDN station interrogation.

- HDRSS TIME ON-OFF

 The HDRSS ON and OFF times are given in GMT to the nearest minute. The ON time is the time the (A or B) HDRSS begins recording experiment

Table 2-1

Nimbus 6 Brouwer Mean Orbital Elements for
November and December 1976

Epoch	GMT	12 Nov 76 00 00 00	22 Nov 76 00 00 00	13 Dec 76 00 00 00	22 Dec 76 00 00 00
Semi-Major Axis	Km	7485.353	7485.349	7485.347	7485.347
Eccentricity		.000844	.000821	.000772	.000762
Inclination	Degrees	99.948	99.949	99.950	99.950
Argument of Perigee	Degrees	77.163	55.580	4.082	341.218
Right Ascension of Ascending Node	Degrees	226.147	235.957	256.554	265.383
Height of Perigee	Km	1100.87	1101.04	1101.40	1101.47
Height of Apogee	Km	1113.51	1113.33	1112.96	1112.89
Anomalistic Period	Minutes	107.41771	107.41763	107.41758	107.41759
Motion of Perigee	Deg. per Day	-2.4202	-2.4202	-2.4200	-2.4201

measurements; the OFF time is when it stops recording. Usually, the ON and OFF times occurs when the satellite is within acquisition range on one of the four STDN stations. The time span between each ON and OFF usually covers part of two DATA ORBITS.

- LRIR, THIR, TDRE, SCAM, ESMR, ERB, PMR, TWRL, HIRS

These are the acronyms for each of the experiments on Nimbus 6. (Acronyms longer than four letters have been shortened.) The column beneath each acronym contains a series of "X's" or "blanks." Each "X" in the column indicates that the data for that experiment was processed at GSFC. A "blank" usually indicates that the experiment was turned off for the HDRSS ON-OFF time in that line. A single "blank" in the middle of a series of "X's" frequently means that the experiment was on during the time span but the data has not been processed, or is unavailable for any of several reasons.

- DATA ORBIT

 A DATA ORBIT begins when the satellite crosses the equator heading in a northbound direction, and ends after the satellite has circled the earth and is about to cross the equator heading in a northbound direction. The DATA ORBIT number increases by one with each successive northbound equator crossing. The ASCENDING NODE and DESCENDING NODE information is referenced to the DATA ORBIT number.

- ASCENDING NODE TIME (and) LONG

 The ASCENDING NODE is the point in the orbit when the satellite crosses the equator heading in a northbound direction. The TIME of ASCENDING NODE is given in hours (HR), minutes (MN), and seconds (SS) GMT. The longitude (LONG) of ASCENDING NODE is given to the nearest tenth of a degree of east (E) or west (W) longitude. For Nimbus 6, the ascending node crossings always occur during the daytime portion of the orbit at approximately 11:45 a.m. local time.

- DESCENDING NODE TIME (and) LONG

 The DESCENDING NODE is the point within a DATA ORBIT when the satellite crosses the equator heading in a southbound direction, The TIME of DESCENDING NODE is given in hours (HR), minutes (MN), and seconds (SS) GMT. The longitude (LONG) of DESCENDING NODE is given to the nearest degree of east (E) or west (W) longitude. The descending node crossings always occur during the nighttime portion of each orbit at approximately 11:45 p.m. local time.

Table 2-2 together with the World Map (Figure 2-1) and the vellum Subsatellite Tracks Overlay attached to the back of this catalog, can be used to determine approximate geographic coverages and times for experiment data that the user may wish to order. The Overlay contains 14 correctly spaced satellite subpoint tracks, which end at the approximate earth day-to-night transitions. The tracks contain time ticks spaced 5 minutes apart, appropriately annotated at the edge of the overlay and referenced to the equator.

A Subsatellite Tracks Overlay is correctly oriented with the World Map when the ascending or descending node line (equator) on the overlay coincides with the 0-degree latitude line (equator) of the World Map.

Orbital coverage for all orbits on any day is then determined by placing one of the orbit tracks on the overlay at its appropriate ascending node (for daytime data) or descending node (for nighttime data) longitude. (The nodes for each day are listed in Table 2-2.) The orbit track (or tracks) which covers the area of interest is readily apparent.

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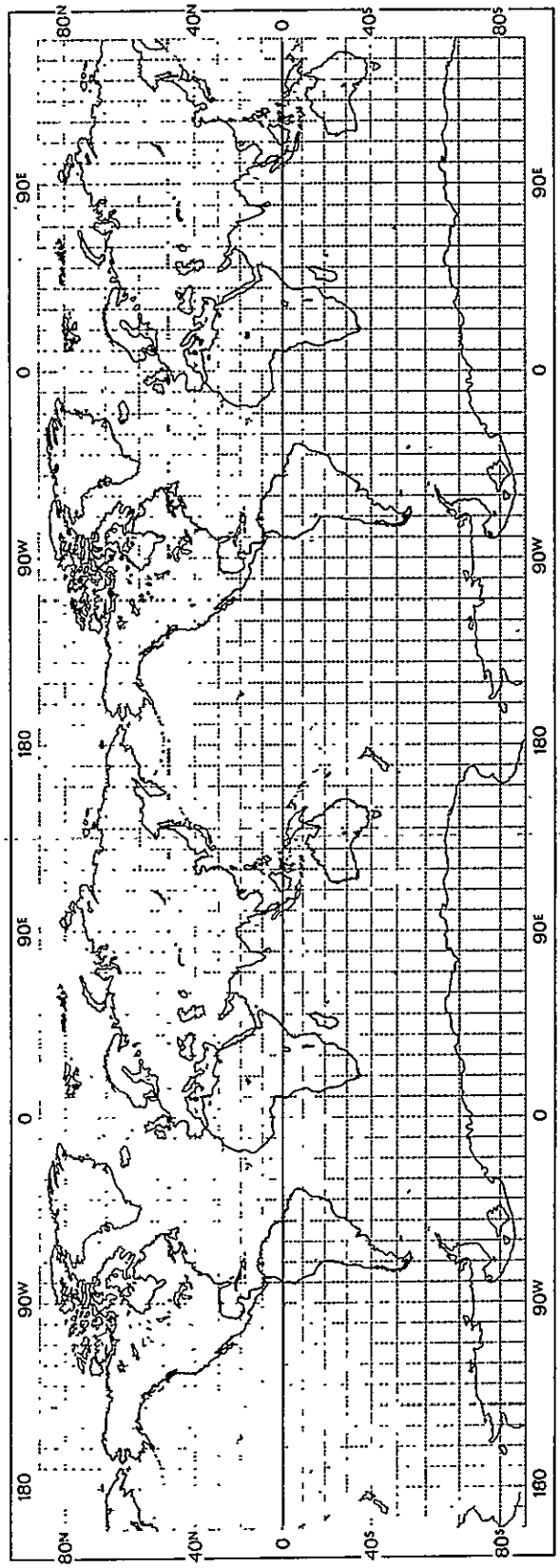


Figure 2-1. World Map

The time (GMT) of satellite passage over an area of interest is calculated by adding or subtracting the minutes from equator crossing (as determined from the overlay) to the appropriate node time (derived from Table 2-2). For daytime orbits, time is added to the ascending node for areas north of the equator, and subtracted from the ascending node for areas south of the equator. For nighttime orbits, time is subtracted from the descending node for areas north of the equator, and added to the descending node for areas south of the equator.

To determine if an experiment was ON during the calculated orbit and time of interest, the user must first "fit" the calculated time into the correct ON-OFF interval of an interrogation orbit listed in Table 2-2. Then the user must check the appropriate experiment column for that line. If an "X" is in the column, the experiment was on and the data has been processed. If the column is "blank", the experiment was off (or the data was not processed) and no data for that orbit is available.

An alternate method of determining geographic coverage and time of data is to use the method described in Section 4. The THIR montages and the vellum Location Guides (attached in the back of this catalog) are used to locate the geographical coverage of each orbit of THIR. The data coverage from other experiments will be within the limits of each THIR swath. The TIME of coverage over a particular area is obtained by using Table 4-1 and adding or subtracting this computed time to the appropriate ascending or descending node time given in Table 2-2.

Each request for data should contain, as a minimum, the name of the experiment for which data is requested, the calendar date of the data, the orbit, the time (GMT) interval of the data needed, and the geographic limits of the area of interest. The procedures described above will provide this information.

The nature and format of the data available from each experiment are explained in detail in the respective sections of The Nimbus 6 User's Guide. The appropriate sources for requesting the various data types are listed in Section 1.7 of the same manual.

TABLE 2–2
DATA AVAILABILITY ON–OFF TIMES
01 NOVEMBER 1976

INT ORBIT AND STDN	H D R S	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	L R I R	T H I R	T D R E	S C A M	E S M R	E R B	P M R	T W R L	H I R S	ASCENDING NODE DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
68020	B	2318	0022					X	X	X	X		6803	004417	E163.9	013755	W029.5
68030	B	0036	0140					X	X	X	X		6804	023120	E137.0	032527	W056.4
6805R	B	0350	0511					X	X	X	X		6805	041920	E110.1	051259	W083.3
6806R	B	0536	0656					X	X	X	X		6806	060652	E083.3	070031	W110.2
6807A	B	0715	0836					X	X	X	X		6807	075424	E056.4	084802	W137.0
6808A	B	0902	1023					X	X	X	X		6808	094156	E029.5	103534	W164.0
6809A	B	1047	1210		X			X	X	X	X		6809	112927	E002.6	122306	E169.2
6810A	B	1234	1355		X			X	X	X	X		6810	131659	W024.3	141038	E142.3
6811A	B	1352	1539		X			X	X	X	X		6811	150431	W051.2	155809	E115.4
6812A	B	1602	1723		X			X	X	X	X		6812	165203	W078.0	174541	E088.6
6813A	B	1746	1907		X			X	X	X	X		6813	183934	W104.9	193313	E061.7
6814A	B	1934	2054		X			X	X	X	X		6814	202706	W131.8	212045	E034.8
6815A	B	2120	2241		X			X	X	X	X		6815	221438	W158.7	230816	E007.9

TABLE 2–2
DATA AVAILABILITY ON–OFF TIMES
02 NOVEMBER 1976

INT ORBIT AND STDN	H D R S	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	L R I R	T H I R	T D R E	S C A M	E S M R	E R B	P M R	T W R L	H I R S	ASCENDING NODE DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
6816C	B	2320	0024					X	X	X	X		6816	000211	E174.4	005549	W019.0
6817C	B	0151	0245					X	X	X	X		6817	014943	E147.5	024321	W045.9
6819R	B	0454	0616		X			X	X	X	X		6818	033715	E120.7	043053	W072.8
6820A	B	0634	0751		X			X	X	X	X		6819	052446	E093.8	061825	W099.6
6821A	B	0820	0942		X			X	X	X	X		6820	071218	E066.9	080556	W126.5
6822A	B	1006	1128		X			X	X	X	X		6821	085950	E040.0	095328	W153.4
6823A	B	1152	1314		X			X	X	X	X		6822	104722	E013.1	114100	E179.7
6824A	B	1336	1458		X			X	X	X	X		6823	123453	W013.8	132832	E152.8
6825A	B	1520	1642		X			X	X	X	X		6824	142225	W040.7	151603	E126.0
6826A	B	1704	1827		X			X	X	X	X		6825	160957	W067.5	170335	E099.1
6827A	B	1850	2012		X			X	X	X	X		6826	175729	W094.4	185107	E072.2
6828A	B	2038	2159		X			X	X	X	X		6827	194500	W121.3	203839	E045.3
6829A	B	2227	2345		X			X	X	X	X		6828	213232	W148.2	222611	E018.4
													6829	232004	W175.1	001342	W008.5

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TABLE 2–2
DATA AVAILABILITY ON–OFF TIMES
03 NOVEMBER 1976

INT ORBIT AND STDN	H D R S	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	L R I R	T H I R	T D R F	S C A M	E S M R	E R B	P M R	T W R L	H I R S	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
68290	B	2343	0046					X	X	X	X		6830	010736	E158.1	020114	W035.3
68300	B	0102	0205					X	X	X	X		6831	025507	E131.2	034846	W062.2
6832R	B	0411	0533		X			X	X	X	X		6832	044239	E104.3	053617	W089.1
6833R	B	0558	0718		X			X	X	X	X		6833	063011	E077.4	072349	W116.0
6834A	B	0738	0859		X			X	X	X	X		6834	081743	E050.5	091121	W142.9
6835A	B	0924	1047		X			X	X	X	X		6835	100514	E023.7	105853	W169.8
6836A	B	1110	1233		X			X	X	X	X		6836	115246	W003.2	124625	W163.4
6837A	B	1256	1417		X			X	X	X	X		6837	134018	W030.1	143356	E136.5
6838A	B	1440	1600		X			X	X	X	X		6838	152750	W057.0	162128	E109.6
6839A	B	1623	1746		X			X	X	X	X		6839	171521	W083.9	180900	E082.7
6840A	B	1810	1931		X			X	X	X	X		6840	190253	W110.8	195632	E055.8
6841A	B	1958	2118		X			X	X	X	X		6841	205025	W137.7	214403	E029.0
6842A	B	2143	2303		X			X	X	X	X		6842	223757	W164.6	233135	E002.1

TABLE 2–2
DATA AVAILABILITY ON–OFF TIMES
04 NOVEMBER 1976

INT ORBIT AND STDN	H D R S	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	L R I R	T H I R	T D R E	S C A M	E S M R	E R B	P M R	T W R L	H I R S	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
68430	B	2343	0047					X	X	X	X		6843	002528	E168.6	011907	W024.8
6844C	B	0204	0308					X	X	X	X		6844	021300	E141.7	030639	W051.7
6845R	B	0348	0452		X			X	X	X	X		6845	040032	E114.8	045410	W078.6
6846R	B	0516	0638		X			X	X	X	X		6846	054804	E088.0	064142	W105.5
6847A	B	0658	0816		X			X	X	X	X		6847	073535	E061.1	082914	W132.4
6848A	B	0843	1004		X			X	X	X	X		6848	092307	E034.2	101646	W159.3
6849A	B	1030	1151		X			X	X	X	X		6849	111039	E007.3	120417	E173.9
6850A	B	1215	1336		X			X	X	X	X		6850	125811	W019.6	135149	E147.0
6851A	B	1359	1520		X			X	X	X	X		6851	144542	W046.5	153921	E120.1
6852A	B	1542	1704		X			X	X	X	X		6852	163314	W073.4	172653	E093.2
6853A	B	1727	1849		X			X	X	X	X		6853	182046	W100.3	191424	E066.3
6854A	B	1914	2019		X			X	X	X	X		6854	200818	W127.1	210156	E039.5
6855A	B	2102	2222		X			X	X	X	X		6855	225549	W154.0	224928	E012.6
6856A	B	2252	0008		X			X	X	X	X		6856	234321	E179.1	003700	W014.3

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TABLE 2–2
DATA AVAILABILITY ON–OFF TIMES
05 NOVEMBER 1976

INT ORBIT AND STON	H D R S	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	L R I R	T H I R	T D R E	S C A M	E S M R	E R B	P M R	T W R L	H I R S	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
6859R	B	0434	0558		X			X	X	X	X		6857	013053	E152.2	022431	W041.2
6860A	B	0616	0732		X			X	X	X	X		6858	031825	E125.4	041203	W068.1
6861A	B	0802	0923		X			X	X	X	X		6859	050556	E098.5	055935	W095.0
6862A	B	0947	1110		X			X	X	X	X		6860	065328	E071.6	074707	W121.8
6863A	B	1134	1256		X			X	X	X	X		6861	084100	E044.7	093438	W148.7
6864A	B	1318	1440		X			X	X	X	X		6862	102832	E017.8	112210	W175.6
6865A	B	1502	1623		X			X	X	X	X		6863	121604	W009.1	130942	E157.5
6866A	B	1646	1809		X			X	X	X	X		6864	140335	W036.0	145714	E130.6
6867A	B	1831	1955		X			X	X	X	X		6865	155107	W062.8	164445	E103.7
6868A	B	2019	2141		X			X	X	X	X		6866	173839	W089.7	183217	E076.9
6869A	B	2227	2322		X			X	X	X	X		6867	192611	W116.6	201949	E050.0
													6868	211342	W143.5	220721	E023.1
													6869	230114	W170.4	235452	W003.8

TABLE 2–2
DATA AVAILABILITY ON–OFF TIMES
06 NOVEMBER 1976

INT ORBIT AND STON	H D R S	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	L R I R	T H I R	T D R E	S C A M	E S M R	E R B	P M R	T W R L	H I R S	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
6870C	B	0044	0144					X	X	X	X		6870	004846	E162.7	014224	W030.7
6873R	B	0539	0700		X			X	X	X	X		6871	023618	E135.9	032956	W057.5
6874A	B	0720	0840		X			X	X	X	X		6872	042349	E109.0	051728	W084.4
6875A	B	0906	1028		X			X	X	X	X		6873	061121	E082.1	070459	W111.3
6876A	B	1052	1214		X			X	X	X	X		6874	075353	E055.2	085231	W138.2
6877A	B	1238	1359		X			X	X	X	X		6875	094625	E028.3	104003	W165.1
6878A	B	1422	1543		X			X	X	X	X		6876	113356	E001.4	122735	E168.0
6879A	B	1606	1727		X			X	X	X	X		6877	132128	W025.4	141506	E141.2
6880A	B	1750	1913		X			X	X	X	X		6878	150900	W052.3	160238	E114.3
6881A	B	1938	2059		X			X	X	X	X		6879	165632	W079.2	175010	E087.4
6882A	B	2124	2246		X			X	X	X	X		6880	184403	W106.1	193742	E060.5
													6881	203135	W133.0	212513	E033.6
													6882	221907	W159.8	231245	E006.7

TABLE 2–2
DATA AVAILABILITY ON–OFF TIMES
07 NOVEMBER 1976

INT ORBIT AND STDN	H D R S	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	L R I R	T H I R	T D R E	C A M	E S M R	E R B	P M P	T W R L	H I R S	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
68830	B	2323	0028					X	X	Y	X		6883	000640	E173.2	010018	W020.2
68840	B	0147	0251					X	X	Y	X		6884	015411	E146.4	024750	W047.1
6885R	B	0333	0433		X			X	X	Y	X		6885	034143	E119.5	043521	W073.9
6886R	B	0458	0620		X			X	X	Y	X		6886	052915	E092.6	062253	W100.8
6887A	B	0639	0756		X			X	X	Y	X		6887	071647	E065.7	081025	W127.7
6888A	B	0824	0946		X			X	X	Y	X		6888	090418	E038.8	095757	W154.6
6889A	B	1010	1133		X			X	X	Y	X		6889	105150	E011.9	114528	E178.5
6890A	B	1156	1318		X			X	X	Y	X		6890	123922	W014.9	133300	E151.7
6891A	B	1342	1501		X			X	X	Y	X		6891	142654	W041.8	152032	E124.8
6892A	B	1524	1646		X			X	X	Y	X		6892	161425	W068.7	170804	W097.9
6893A	B	1710	1832		X			X	X	Y	X		6893	180157	W095.6	185535	E071.0
6894A	B	1856	2017		X			X	X	Y	X		6894	194929	W122.5	204307	E044.1
6895A	B	2042	2204		X			X	X	Y	X		6895	213701	W149.4	223039	E017.2
6896A	B	2232	2350		X			X	X	Y	X		6896	232432	W176.2	001811	W009.7

TABLE 2–2
DATA AVAILABILITY ON–OFF TIMES
08 NOVEMBER 1976

INT ORBIT AND STDN	H D R S	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	L R I R	T H I R	T D R E	C A M	E S M R	E R B	P M P	T W R L	H I R S	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
6896C	B	2346	0049					X	X	Y	X		6897	011204	E156.9	020543	W036.5
6897C	B	0106	0210					X	X	Y	X		6898	025936	E130.0	035314	W063.4
6899R	B	0415	0538		X			X	X	Y	X		6899	044708	E103.1	054046	W090.3
6900R	B	0603	0722		X			X	X	Y	X		6900	063439	E076.2	072818	W117.2
6901A	B	0742	0903		X			X	X	Y	X		6901	082211	E049.4	091550	W144.1
6902A	B	0929	1052		X			X	X	Y	X		6902	100943	E022.5	110321	W170.9
6903A	B	1115	1238		X			X	X	Y	X		6903	115715	W004.4	125053	E162.2
6904A	B	1300	1422		X			X	X	Y	X		6904	134447	W031.3	143825	E135.3
6905A	B	1444	1605		X			X	X	Y	X		6905	153218	W058.2	162557	E108.4
6906A	B	1628	1750		X			X	X	Y	X		6906	171950	W085.1	181328	E081.5
6907A	B	1814	1936		X			X	X	Y	X		6907	190722	W112.0	200100	E054.6
6908A	B	2001	2122		X			X	X	Y	X		6908	205454	W138.8	214832	E027.8
6909A	B	2148	2308		X			X	X	Y	X		6909	224225	W165.7	233604	E008.9

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TABLE 2–2
DATA AVAILABILITY ON–OFF TIMES
09 NOVEMBER 1976

INT ORBIT AND STDN	H D R S	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	L R I R	T H I R	T D R E	S C A M	E S M R	E E R B	P M R	T W R L	H I R S	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
69090	B	2303	0007					X	X	X	X		6910	002957	E167.4	012335	W026.0
6910C	B	0022	0125					X	X	X	X		6911	021729	E140.5	031107	W052.9
6913R	B	0522	0643		X			X	X	X	X		6912	040501	E113.6	045839	W079.8
6914A	B	0702	0821		X			X	X	X	X		6913	055232	E086.8	064611	W106.7
6915A	B	0847	1003		X			X	X	X	X		6914	074004	E059.9	083342	W133.5
6916A	B	1032	1156		X			X	X	X	X		6915	092736	E033.0	102114	W160.4
6917A	B	1219	1341		X			X	X	X	X		6916	111508	E006.1	120846	E172.7
6918A	B	1407	1524		X			X	X	X	X		6917	130239	W020.8	135618	E145.8
6919A	B	1547	1708		X			X	X	X	X		6918	145011	W047.7	154349	E118.9
6920A	B	1732	1854		X			X	X	X	X		6919	163743	W074.5	173121	E092.1
6921A	B	1924	2040		X			X	X	X	X		6920	182515	W101.4	191853	E065.2
6922A	B	2106	2225		X			X	X	X	X		6921	201246	W128.3	210625	E038.3
6923A	B	2258	0011		X			X	X	X	X		6922	220018	W155.2	225357	E011.4
													6923	234750	E177.9	004128	W015.5

TABLE 2–2
DATA AVAILABILITY ON–OFF TIMES
10 NOVEMBER 1976

INT ORBIT AND STDN	H D R S	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	L R I R	T H I R	T D R E	S C A M	E S M R	E E R B	P M R	T W R L	H I R S	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
69230	B	0010	0114					X	X	X	X		6924	013522	E151.1	022900	W042.4
6924C	B	0127	0231					X	X	X	X		6925	032253	E124.2	041632	W069.3
6925R	B	0311	0413		X			X	X	X	X		6926	051025	E097.3	060404	W096.1
6926R	B	0438	0602		X			X	X	X	X		6927	065757	E070.4	075135	W123.0
6927A	B	0620	0737		X			X	X	X	X		6928	084529	E043.5	093907	W149.9
6928A	B	0806	0927		X			X	X	X	X		6929	103300	E016.6	112639	W176.8
6929A	B	0952	1115		X			X	X	X	X		6930	122032	W010.3	131411	E156.3
6930A	B	1138	1257		X			X	X	X	X		6931	140804	W037.1	150142	E129.5
6931A	B	1322	1444		X			X	X	X	X		6932	155536	W064.0	164914	E102.6
6932A	B	1506	1627		X			X	X	X	X		6933	174307	W090.9	183646	E075.7
6933A	B	1650	1813		X			X	X	X	X		6934	193039	W117.8	202418	E048.8
6934A	B	1836	1958		X			X	X	X	X		6935	211811	W144.7	221149	E021.9
6935A	B	2047	2145		X			X	X	X	X		6936	230543	W171.6	235921	000.0
6936A	B	2212	2331		X			X	X	X	X						

TABLE 2–2
DATA AVAILABILITY ON–OFF TIMES
11 NOVEMBER 1976

INT ORBIT AND STDN	H D R S	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	LR IR R	TH IR R	TD IR E	<C A M	ES MR R	ER BR R	PM RR R	TW RL L	HI RR S	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
6936C	B	2328	0031					X	X	X	X		6937	005314	E161.6	014653	W031.8
69370	B	0047	0150					X	X	X	X		6938	024046	E134.7	033425	W058.7
6939R	B	0400	0519		X			X	X	X	X		6939	042818	E107.8	052156	W085.6
6940R	B	0544	0703		X			X	X	X	X		6940	061550	E080.9	070928	W112.5
6941A	B	0724	0844		X			X	X	X	X		6941	080322	E054.0	085700	W139.4
6942A	B	0910	1032		X			X	X	X	X		6942	095053	E027.2	104432	W166.3
6943A	B	1056	1219		X			X	X	X	X		6943	113825	E000.3	123203	E166.9
6944A	B	1242	1404		X			X	X	X	X		6944	132557	W026.6	141935	E140.0
6945A	B	1426	1547		X			X	X	X	X		6945	151328	W053.5	160707	E113.1
6946A	B	1610	1731		X			X	X	X	X		6946	170100	W080.4	175439	E086.2
6947A	B	1754	1916		X			X	X	X	X		6947	184832	W107.3	194210	E059.3
6948A	B	1942	2103		X			X	X	X	X		6948	203604	W134.1	212942	E032.5
6949A	B	2130	2249		X			X	X	X	X		6949	222336	W161.0	231714	E005.6

TABLE 2–2
DATA AVAILABILITY ON–OFF TIMES
12 NOVEMBER 1976

INT ORBIT AND STDN	H D R S	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	LR IR R	TH IR R	TD IR E	<C A M	ES MR R	ER BR R	PM RR R	TW RL L	HI RR S	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
6952R	B	0318	0434		X			X	X	X	X		6950	001107	E172.1	010446	W021.3
6953R	B	0503	0623		X			X	X	X	X		6951	015839	E145.2	025218	W048.2
6954A	B	0643	0802		X			X	X	X	X		6952	034611	E118.3	043949	W075.1
6955A	B	0828	0950		X			X	X	X	X		6953	053343	E091.5	062721	W102.0
6956A	B	1015	1138		X			X	X	X	X		6954	072114	E064.6	081453	W128.9
6957A	B	1200	1319		X			X	X	X	X		6955	090846	E037.7	100225	W155.7
6958A	B	1346	1507		X			X	X	X	X		6956	105618	E010.8	114956	W177.4
6959A	B	1530	1650		X			X	X	X	X		6957	124350	W016.1	133728	E150.5
6960A	B	1714	1836		X			X	X	X	X		6958	143121	W043.0	152500	E123.6
6961A	B	1900	2021		X			X	X	X	X		6959	161853	W069.9	171232	E096.7
6962A	B	2047	2208		X			X	X	X	X		6960	180625	W096.7	190003	E069.9
6963A	B	2246	2351		X			X	X	X	X		6961	195357	W123.6	204735	E043.0
													6962	214128	W150.5	223507	E016.1
													6963	232900	W177.4	002239	W010.8

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TABLE 2–2
DATA AVAILABILITY ON–OFF TIMES
13 NOVEMBER 1976

INT ORBIT AND STDN	H D R S	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	L R I R	T H I R	T D R E	< C A M	E S M R	E R B	P M R P	T W R L	H I R S	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
69640	B	0111	0214					X	X	Y	X		6964	011632	E155.7	021010	W037.7
6966R	B	0420	0533		X			X	X	Y	X		6965	030404	E128.9	035742	W064.6
6967R	B	0608	0724		X			X	X	Y	X		6966	045135	E102.0	054514	W091.4
6968A	B	0747	0908		X			X	X	Y	X		6967	063907	E075.1	073246	W118.3
6969A	B	0934	1057		X			X	X	Y	X		6968	082639	E048.2	092017	W145.2
6970A	B	1120	1242		X			X	X	Y	X		6969	101411	E021.3	110749	W172.1
6971A	B	1304	1419		X			X	X	Y	X		6970	120142	W005.6	125521	E161.0
6972A	B	1448	1610		X			X	X	Y	X		6971	134914	W032.4	144253	E134.2
6973A	B	1632	1754		X			X	X	Y	X		6972	153646	W059.3	163024	E107.3
6974A	B	1818	1940		X			X	X	Y	X		6973	172418	W086.2	181756	E080.4
6975A	B	2006	2127		X			X	X	Y	X		6974	191149	W113.1	200528	E053.5
6976A	B	2152	2312		X			X	X	Y	X		6975	205921	W140.0	215300	E026.6
													6976	224653	W166.9	234032	W002.3

TABLE 2–2
DATA AVAILABILITY ON–OFF TIMES
14 NOVEMBER 1976

INT ORBIT AND STDN	H D R S	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	L R I R	T H I R	T D R E	< C A M	E S M R	E R B	P M R P	T W R L	H I R S	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
69760	B	2309	0011					X	X	Y	X		6977	003422	E166.3	012801	W027.1
69770	B	0026	0129					X	X	Y	X		6978	022154	E139.4	031533	W054.0
6979R	B	0340	0501		X			X	X	Y	X		6979	040926	E112.5	050304	W080.9
6980R	B	0526	0646		X			X	X	Y	X		6980	055658	E085.6	065036	W107.8
6981A	B	0706	0823		X			X	X	Y	X		6981	074429	E058.7	083808	W134.7
6982A	B	0851	1012		X			X	X	Y	X		6982	093201	E031.9	102540	W161.6
6983A	B	1038	1201		X			X	X	Y	X		6983	111933	E005.0	121311	E171.6
6984A	B	1223	1336		X			X	X	Y	X		6984	130705	W021.9	140043	E144.7
6985A	B	1408	1529		X			X	X	Y	X		6985	145436	W048.8	154815	E117.8
6986A	B	1551	1713		X			X	X	Y	X		6986	164208	W075.7	173547	E090.9
6987A	B	1736	1859		X			X	X	Y	X		6987	182940	W102.6	192318	E064.0
6988A	B	1923	2037		X			X	X	Y	X		6988	201712	W129.4	211050	E037.2
6989A	B	2110	2231		X			X	X	Y	X		6989	220443	W156.3	225822	E010.3
6990A	B	2305	0016		X			X	X	Y	X		6990	235215	E176.8	004554	W016.6

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TABLE 2–2
DATA AVAILABILITY ON–OFF TIMES
15 NOVEMBER 1976

INT ORBIT AND STDN	H D R S	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	LIR	THR	TDRE	CSM	ESR	ERB	PMR	TWR	HIR	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
69900	B	0016	0118				X	X	X	X			6991	013947	E149.9	023325	W043.5
6992R	B	0259	0418		X		X	X	X	X			6992	032719	E123.0	042057	W070.4
6993R	B	0443	0606		X		X	X	X	X			6993	051450	E096.2	060829	W097.3
6994A	B	0624	0742		X		X	X	X	X			6994	070222	E069.3	075601	W124.1
6995A	B	0810	0932		X		X	X	X	X			6995	084954	E042.4	094332	W151.0
6996A	B	0956	1119		X		X	X	X	X			6996	103726	E015.5	113104	W177.9
6997A	B	1142	1305		X		X	X	X	X			6997	122457	W011.4	131836	E155.2
6998A	B	1327	1449		X		X	X	X	X			6998	141229	W038.3	150608	E128.3
6999A	B	1510	1632		X		X	X	X	X			6999	160001	W065.2	165339	E101.4
7000A	B	1655	1817		X		X	X	X	X			7000	174733	W092.0	184111	E074.6
7001A	B	1840	2001		X		X	X	X	X			7001	193504	W118.9	202843	E047.7
7002A	B	2028	2149		X		X	X	X	X			7002	212236	W145.8	221615	E020.8
7003A	B	2218	2335		X		X	X	X	X			7003	231008	W172.7	000346	W006.1

TABLE 2–2
DATA AVAILABILITY ON–OFF TIMES
16 NOVEMBER 1976

INT ORBIT AND STDN	H D R S	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	LIR	THR–F	TDRE	CSM	ESR	ERB	PMR	TWR	HIR	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
70030	B	2332	0035				X	X	X	X			7004	005740	E160.4	015118	W033.0
7006R	B	0402	0523		X		X	X	X	X			7005	024511	E133.6	033850	W059.9
7007R	B	0548	0708		X		X	X	X	X			7006	043243	E106.7	052622	W086.7
7008A	B	0728	0850		X		X	X	X	X			7007	062015	E079.8	071353	W113.6
7009A	B	0914	1037		X		X	X	X	X			7008	080747	E052.9	090125	W140.5
7010A	B	1100	1215		X		X	X	X	X			7009	095518	E026.0	104857	W167.4
7011A	B	1246	1408		X		X	X	X	X			7010	114250	W000.9	123629	E165.7
7012A	B	1430	1551		X		X	X	X	X			7011	133022	W027.8	142400	E138.9
7013A	B	1614	1736		X		X	X	X	X			7012	151753	W054.6	161132	E112.0
7014A	B	1759	1921		X		X	X	X	X			7013	170525	W081.5	175904	E085.1
7016A	B	2134	2254		X		X	X	X	X			7014	195257	W108.4	194636	E058.2
													7015	204029	W135.3	213407	E031.3
													7016	222800	W162.2	232139	E004.4

TABLE 2–2
DATA AVAILABILITY ON–OFF TIMES
17 NOVEMBER 1976

INT ORBIT AND STDN	H D R S	HDRSS TIME ON HRMN	OFF HRMN	L R I R	T H I R	T D R E	S C A M	E S M R	E R B	P M P	T W R L	H I R S	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
7018C	B	0158	0300					X	X	X	X		7017	001532	E171.0	010911	W022.4
7019R	B	0337	0442		X			X	X	X	X		7018	020304	E144.1	025643	W049.3
7020R	B	0507	0629		X			X	X	X	X		7019	035036	E117.2	044414	W076.2
7021A	B	0647	0802		X			X	X	X	X		7020	053807	E090.3	063146	W103.1
7022A	B	0834	0954		X			X	X	X	X		7021	072539	E063.4	081918	W130.0
7023A	B	1019	1141		X			X	X	X	X		7022	091311	E036.6	100650	W156.9
7024A	B	1206	1324		X			X	X	X	X		7023	110043	E009.7	115421	E176.3
7025A	B	1350	1509		X			X	X	X	X		7024	124814	W017.2	134153	E149.4
7026A	B	1534	1654		X			X	X	X	X		7025	143546	W044.1	152925	E122.5
7027A	B	1718	1839		X			X	X	X	X		7026	162318	W071.0	171657	E095.6
7028A	B	1904	2025		X			X	X	X	X		7027	181050	W097.9	190428	E068.7
7029A	B	2051	2212		X			X	X	X	X		7028	195821	W124.7	205200	E041.9
7030A	B	2248	2352		X			X	X	X	X		7029	214553	W151.6	223932	E015.0
													7030	233325	W178.5	002704	W011.9

TABLE 2–2
DATA AVAILABILITY ON–OFF TIMES
18 NOVEMBER 1976

INT ORBIT AND STDN	H D R S	HDRSS TIME ON HRMN	OFF HRMN	L R I R	T H I R	T D R E	S C A M	E S M R	E R B	P M P	T W R L	H I R S	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
7031C	B	0114	0217					X	X	X	X		7031	012057	E154.6	021435	W038.8
7032R	B	0256	0359		X			X	X	X	X		7032	030828	E127.7	040207	W065.7
7033R	B	0424	0547		X			X	X	X	X		7033	045600	E100.8	054939	W092.6
7034A	B	0606	0721		X			X	X	X	X		7034	064332	E074.0	073711	W119.5
7035A	B	0751	0912		X			X	X	X	X		7035	083104	E047.1	092442	W146.3
7036A	B	0938	1052		X			X	X	X	X		7036	101835	E020.2	111214	W173.2
7037A	B	1123	1247		X			X	X	X	X		7037	120607	W006.7	125946	E159.9
7038A	B	1258	1430		X			X	X	X	X		7038	135339	W033.6	144718	E133.0
7039A	B	1444	1614		X			X	X	X	X		7039	154111	W060.5	163449	E106.1
7040A	B	1632	1759		X			X	X	X	X		7040	172842	W087.3	182221	E079.3
7041A	B	1822	1944		X			X	X	X	X		7041	191614	W114.2	200953	E052.4
7042A	B	2010	2131		X			X	X	X	X		7042	210346	W141.1	215725	E025.5
7043A	B	2158	2317		X			X	X	X	X		7043	225118	W168.0	234456	W001.4

TABLE 2–2
DATA AVAILABILITY ON–OFF TIMES
19 NOVEMBER 1976

NT BIT ND TDN	H D R S	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	L R I R	T H I R	T D R F	S C A M	E S M R	E R B	P M R	T W R L	H I R S	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
046R	B	0344	0504		X			X	X	X	X		7044	003849	E165.1	013228	W028.3
047R	B	0530	0650		X			X	X	X	X		7045	022621	E138.3	032000	W055.2
048A	B	0710	0822		X			X	X	X	X		7046	041353	E111.4	050732	W082.0
049A	B	0856	1010		X			X	X	X	X		7047	060124	E084.5	065503	W108.9
050A	B	1042	1156		X			X	X	X	X		7048	074856	E057.6	084235	W135.8
051A	B	1228	1344		X			X	X	X	X		7049	093628	E030.7	103007	W162.7
052A	B	1412	1526		X			X	X	X	X		7050	112400	E003.8	121739	E170.4
053A	B	1555	1710		X			X	X	X	X		7051	131131	W023.0	140510	E143.5
054A	B	1740	1854		X			X	X	X	X		7052	145903	W049.9	155242	E116.7
055A	B	1928	2048		X			X	X	X	X		7053	164635	W076.8	174014	E089.8
056A	B	2114	2235		X			X	X	X	X		7054	183407	W103.7	192746	E062.9
													7055	202138	W130.6	211517	E036.0
													7056	220910	W157.5	230249	E009.1
													7057	235642	E175.7	005021	W017.8

TABLE 2–2
DATA AVAILABILITY ON–OFF TIMES
20 NOVEMBER 1976

NT BIT ND TDN	H D R S	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	L R I R	T H I R	T D R F	S C A M	E S M R	E R B	P M R	T W R L	H I R S	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
057C	B	2314	0018					X	X	X	X		705R	014414	E148.8	023753	W044.6
058C	B	0135	0240					X	X	X	X		7059	033145	E121.9	042524	W071.5
059R	B	0318	0423		X			X	X	X	X		7060	051917	E095.0	061256	W098.4
060R	B	0447	0608		X			X	X	X	X		7061	070649	E068.1	080028	W125.3
061A	B	0630	0745		X			X	X	X	X		7062	085421	E041.3	094800	W152.2
062A	B	0814	0935		X			X	X	X	X		7063	104152	E014.4	113531	W179.1
063A	B	1000	1115		X			X	X	X	X		7064	122924	W012.5	132303	E154.1
064A	B	1146	1301		X			X	X	X	X		7065	141656	W039.4	151035	E127.2
065A	B	1331	1452		X			X	X	X	X		7066	160428	W066.3	165807	E100.3
066A	B	1515	1636		X			X	X	X	X		7067	175159	W093.2	184538	E073.4
067A	B	1659	1822		X			X	X	X	X		7068	193931	W120.1	203310	E046.5
068A	B	1846	2007		X			X	X	X	X		7069	212703	W146.9	222042	E019.7
069A	B	2034	2154		X			X	X	X	X		7070	231435	W173.8	000814	W007.2
070A	B	2222	2339		X			X	X	X	X						

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TABLE 2–2
DATA AVAILABILITY ON–OFF TIMES
21 NOVEMBER 1976

ANTENNA BIT NO.	HDR	HDRSS TIME ON	HDRSS TIME OFF	LTR IR	TTY IR	TDRS EMR	SEM RBI	PM R	TWL R	HDR S	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
070C	B	2335	0040			X	X	X	X		7071	010205	E159.3	015544	W034.1
071C	B	0054	0158			X	X	X	X		7072	024937	E132.4	034316	W061.0
073R	B	0407	0527	X		X	X	X	X		7073	043709	E105.6	053048	W087.9
074R	B	0554	0713	X		X	X	X	X		7074	062440	E078.7	071819	W114.9
075A	B	0734	0854	X		X	X	X	X		7075	081212	E051.8	090551	W141.6
076A	B	0919	1041	X		X	X	X	X		7076	095944	E024.9	105323	W168.5
077A	B	1106	1228	X		X	X	X	X		7077	114716	W002.0	124055	E164.6
078A	B	1250	1407	X		X	X	X	X		7078	133447	W028.9	142826	E137.7
079A	B	1434	1555	X		X	X	X	X		7079	152219	W055.7	161558	E110.8
080A	B	1622	1741	X		X	X	X	X		7080	170951	W082.6	180330	E084.0
081A	B	1804	1926	X		X	X	X	X		7081	185722	W109.5	195101	E057.1
082A	B	1951	2112	X		X	X	X	X		7082	204454	W136.4	213833	E030.2
083A	B	2138	2259	X		X	X	X	X		7083	223226	W163.3	232605	E003.3

TABLE 2–2
DATA AVAILABILITY ON–OFF TIMES
22 NOVEMBER 1976

ANTENNA BIT NO.	HDR	HDRSS TIME ON	HDRSS TIME OFF	LTR IR	TTY IR	TDRS EMR	SEM RBI	PM R	TWL R	HDR S	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
084C	B	2336	0040			X	X	X	X		7084	001958	E169.8	011337	W023.6
085C	B	0203	0307			X	X	X	X		7085	020729	E143.0	030108	W050.5
086R	B	0342	0446	X		X	X	X	X		7086	035501	E116.1	044840	W077.3
087R	B	0511	0633	X		X	X	X	X		7087	054233	E089.2	063612	W104.2
088A	B	0652	0810	X		X	X	X	X		7088	073005	E062.3	082344	E131.1
089A	B	0837	1000	X		X	X	X	X		7089	091736	E035.4	101115	W158.0
090A	B	1033	1146	X		X	X	X	X		7090	110508	E008.6	115847	E175.1
091A	B	1210	1332	X		X	X	X	X		7091	125240	W018.3	134619	E148.3
092A	B	1354	1515	X		X	X	X	X		7092	144011	W045.2	153351	E121.4
093A	B	1538	1659	X		X	X	X	X		7093	162743	W072.1	172122	E094.5
094A	B	1722	1845	X		X	X	X	X		7094	181515	W099.0	190854	E067.6
095A	B	1910	2031	X		X	X	X	X		7095	200247	W125.9	205626	E040.7
096A	B	2055	2217	X		X	X	X	X		7096	215018	W152.8	224358	E013.8
097A	B	2247	0003	X							7097	233750	W179.6	003129	W013.0

TABLE 2–2
DATA AVAILABILITY ON–OFF TIMES
23 NOVEMBER 1976

ANT BIT ND TON	HDR S	HDRSS TIME ON HRMN	OFF HRMN	LR IR	TH IR	TDRF	CSM R	SSR B	EMR P	PWR L	THIR S	DATA ORBIT	ASCENDING NODE TIME HRMNSS	LONG DEGREE	DESCENDING NODE TIME HRMNSS	LONG DEGREE
0970	B	0001	0111				X	X	X	X		7098	012522	E153.5	021901	W039.9
0980	B	0118	0222				X	X	X	X		7099	031254	E126.6	040633	W066.8
099R	B	0300	0404		X		X	X	X	X		7100	050025	E099.7	055405	W093.7
100R	B	0428	0552		X		X	X	X	X		7101	064757	E072.8	074136	W120.6
101A	B	0610	0727		X		X	X	X	X		7102	083529	E046.0	092908	W147.5
102A	B	0755	0918		X		X	X	X	X		7103	102301	E019.1	111640	W174.3
103A	B	0943	1105		X		X	X	X	X		7104	121032	W007.8	130411	E158.8
104A	B	1129	1251		X		X	X	X	X		7105	135804	W034.7	145143	E131.9
105A	B	1312	1435		X		X	X	X	X		7106	154535	W061.6	163915	E105.0
106A	B	1456	1618		X		X	X	X	X		7107	173307	W088.5	182647	E078.1
107A	B	1642	1803		X		X	X	X	X		7108	192039	W115.3	201418	E051.3
018A	B	1826	1946		X		X	X	X	X		7109	210811	W142.2	220150	E024.4
109A	B	2014	2135		X		X	X	X	X		7110	225543	W169.1	234922	W002.5
110A	B	2203	2321		X		X	X	X	X						

TABLE 2–2
DATA AVAILABILITY ON–OFF TIMES
24 NOVEMBER 1976

ANT BIT ND TON	HDR S	HDRSS TIME ON HRMN	OFF HRMN	LR IR	TH IR	TDRF	CSM R	SSR B	EMR P	PWR L	THIR S	DATA ORBIT	ASCENDING NODE TIME HRMNSS	LONG DEGREE	DESCENDING NODE TIME HRMNSS	LONG DEGREE
1100	B	2318	0021				X	X	X	X		7111	004314	E164.0	013654	W029.4
1110	B	0035	0138				X	X	X	X		7112	023046	E137.1	032425	W056.3
113R	B	0348	0509		X		X	X	X	X		7113	041818	E110.3	051157	W083.2
114R	B	0534	0654		X		X	X	X	X		7114	060550	E083.4	065929	W110.1
115A	B	0714	0834		X		X	X	X	X		7115	075321	E056.5	084701	W136.9
116A	B	0900	1023		X		X	X	X	X		7116	094053	E029.6	103432	W163.8
117A	B	1047	1209		X		X	X	X	X		7117	112825	E002.7	122204	E169.3
118A	B	1232	1354		X		X	X	X	X		7118	131556	W024.2	140936	E142.4
119A	B	1416	1537		X		X	X	X	X		7119	150328	W051.1	155707	E115.5
120A	B	1600	1722		X		X	X	X	X		7120	165100	W077.9	174439	E088.7
121A	B	1746	1907		X		X	X	X	X		7121	183832	W104.8	193211	E061.8
122A	B	1935	2054		X		X	X	X	X		7122	202603	W131.7	211943	E034.9
												7123	221335	W158.6	230714	E008.0

TABLE 2–2
DATA AVAILABILITY ON–OFF TIMES
25 NOVEMBER 1976

INT RBIT AND STDN	H D R S	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	L R I R	T H R R	T D F E	S C A M	E S M R	E E R B	P M R Q	T W R L	H I R S	ASCENDING NODE DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
71250	B	0210	0314					X	X	X	X		7124	000107	E174.5	005446	W018.9
7126R	B	0332	0423		X			X	X	X	X		7125	014339	E147.7	024218	W045.8
7127R	B	0525	0615		X			X	X	X	X		7126	033610	E120.8	042950	W072.6
7128A	B	0634	0750		X			X	X	X	X		7127	052342	E093.9	061721	W099.5
7129A	B	0818	0940		X			X	X	X	X		7128	071114	E067.0	080453	W126.4
7130A	B	1006	1128		X			X	X	X	X		7129	085845	E040.1	095225	W153.3
7131A	B	1151	1313		X			X	X	X	X		7130	104617	E013.2	113957	E179.8
7132A	B	1335	1456		X			X	X	X	X		7131	123349	W013.6	132729	E153.0
7133A	B	1519	1640		X			X	X	X	X		7132	142121	W040.5	151500	E126.1
7134A	B	1703	1824		X			X	X	X	X		7133	160852	W067.4	170232	E099.2
7135A	B	1850	2012		X			X	X	X	X		7134	175624	W094.3	185004	E072.3
7136A	B	2038	2158		X			X	X	X	X		7135	194356	W121.2	203735	E045.4
7137A	B	2227	2343		X			X	X	X	X		7136	213728	W148.1	222507	E018.5
													7137	231859	W174.9	001239	W008.4

TABLE 2–2
DATA AVAILABILITY ON–OFF TIMES
26 NOVEMBER 1976

INT RBIT AND STDN	H D R S	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	L R I R	T H R R	T D R E	S C A M	E S M R	E E R B	P M R Q	T W R L	H I R S	ASCENDING NODE DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
7140A	B	0410	0532		X			X	X	X	X		7138	010631	E158.2	020010	W035.2
7141R	B	0558	0709		X			X	X	X	X		7139	025403	E131.3	034742	W062.1
7142A	B	0738	0859		X			X	X	X	X		7140	044134	E104.4	053514	W089.0
7143A	B	0923	1046		X			X	X	X	X		7141	062906	E077.5	072246	W115.9
7144A	B	1111	1232		X			X	X	X	X		7142	081638	E050.7	091017	W142.8
7145A	B	1255	1416		X			X	X	X	X		7143	100410	E023.8	105749	W169.7
7146A	B	1439	1559		X			X	X	X	X		7144	115141	N003.1	124521	E163.5
7147A	B	1622	1745		X			X	X	X	X		7145	133913	W030.0	143252	E136.6
7148A	B	1808	1930		X			X	X	X	X		7146	152645	W056.9	162024	E109.7
7149A	B	1956	2117		X			X	X	X	X		7147	171417	W083.8	180756	E082.8
7150A	B	2142	2259		X			X	X	X	X		7148	190148	W110.6	195528	E055.9
													7149	204920	W137.5	214300	E029.1
													7150	223652	W164.4	233031	E002.2

TABLE 2–2
DATA AVAILABILITY ON–OFF TIMES
27 NOVEMBER 1976

INT RBIT AND STDN	H D R S	HDRSS TIME ON HRMN	OFF HRMN	L R I R	T H R R	T D E	C A M	E S F R	F R H D	D H	T W R L	H I R S	DATA ORBIT	ASCENDING NODE TIME HRMNSS	LONG DEGREE	DESCENDING NODE TIME HRMNSS	LONG DEGREE
7151C	B	0046	0150					X	X	Y	X		7151	002423	E168.7	011803	W024.7
7152C	B	0206	0310					Y	x	Y	X		7152	021155	E141.8	030535	W051.6
7153R	B	0347	0449		X			X	x	Y	X		7153	035927	E114.9	045306	W078.5
7154R	B	0515	0630		X			X	X	Y	X		7154	054659	E088.1	064038	W105.4
7155A	B	0656	0815		X			X	x	Y	X		7155	073430	E061.2	082810	W132.2
7156A	B	0842	1004		X			X	y	X	X		7156	092202	E034.3	101542	W159.1
7157A	B	1028	1151		X			X	[illegible]	X	X		7157	110934	E007.4	120313	E174.0
7158A	B	1214	1336		X			X	x	Y	X		7158	125706	N019.5	135045	E147.1
7159A	B	1358	1519		X			X	x	X	X		7159	144437	W046.4	153817	E120.2
7160A	B	1542	1703		y			X	y	X	X		7160	163209	W073.2	172549	W093.4
7161A	B	1726	1849		X			X	x	Y	X		7161	181941	W100.1	191320	E066.5
7162A	B	1914	2035		Y			X	x	Y	X		7162	200712	W127.0	210052	E039.6
7163A	B	2100	2220		Y			X	X	Y	X		7163	215444	W153.9	224824	E012.7
													7164	234216	E179.2	003556	W014.2

TABLE 2–2
DATA AVAILABILITY ON–OFF TIMES
28 NOVEMBER 1976

INT RBIT AND STDN	H D R S	HDRSS TIME ON HRMN	OFF HRMN	L R I R	T H R R	T D E	C A M	E S F R	F R H D	D H	T W R L	H I R S	DATA ORBIT	ASCENDING NODE TIME HRMNSS	LONG DEGREE	DESCENDING NODE TIME HRMNSS	LONG DEGREE
7164C	B	0004	0108					X	x	Y	X		7165	012950	E152.4	022329	W041.1
7165C	B	0123	0227					X	x	Y	X		7166	031721	E125.5	041101	W068.0
7166R	B	0305	0403		X			X	x	Y	X		7167	050453	E098.6	055833	W094.8
7167R	B	0434	0554		Y			X	y	X	X		7168	065225	E071.7	074604	W121.7
7168A	B	0615	0731		Y			X	x	X	X		7169	083956	E044.8	093336	W148.6
7169A	B	0800	0921		y			X	x	Y	X		7170	102728	E017.9	112108	W175.5
7170A	B	0946	1109		X			X	X	Y	X		7171	121500	W009.0	130840	E157.6
7171A	B	1132	1255		X			X	x	Y	X		7172	140232	W035.8	145611	E130.8
7172A	B	1318	1438		X			X	x	Y	X		7173	155003	W062.7	164343	E103.9
7173A	B	1502	1622		X			X	x	Y	X		7174	173735	W089.6	183115	E077.0
7174A	B	1646	1808		X			X	x	Y	X		7175	192507	W116.5	201847	E050.1
7175A	B	1831	1953		Y			X	x	Y	X		7176	211239	W143.4	220618	E023.2
7176A	B	2018	2139		X			X	x	Y	X		7177	230010	W170.3	235350	W003.7
7177A	B	2206	2324		Y			X	x	Y	X						

TABLE 2–2
DATA AVAILABILITY ON–OFF TIMES
29 NOVEMBER 1976

INT ORBIT AND STDN	HDR	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	LR IR	TH IR	TDRF	SAM	SER	EBR	PMR	TWR	HIP S	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
7177C	B	2326	0027					X	X	Y	X		7178	004742	E162.9	014122	W030.5
7178O	B	0039	0143					X	X	Y	X		7179	023514	E136.0	032854	W057.4
7180R	B	0230	0514		X			X	X	Y	X		7180	042246	E109.1	051625	W084.3
7182A	B	0719	0839		X			X	X	Y	X		7181	061017	E082.2	070357	W111.2
7183A	B	0904	1027		X			X	X	Y	X		7182	075749	E055.3	085129	W138.1
7184A	B	1050	1214		X			X	X	Y	X		7183	094521	E028.5	103900	W165.0
7185A	B	1236	1359		X			X	X	Y	X		7184	113252	E001.6	122632	E168.2
7186A	B	1419	1542		X			X	X	Y	X		7185	132024	W025.3	141404	E141.3
7187A	B	1604	1726		X			X	X	Y	X		7186	150756	W052.2	160136	E114.4
7188A	B	1750	1912		X			X	X	Y	X		7187	165528	W079.1	174907	E087.5
7189A	B	1938	2058		X			X	X	Y	X		7188	184259	W108.0	193639	E060.6
7190A	B	2123	2244		X			X	X	Y	X		7189	203031	W132.8	212411	E033.8
													7190	221803	W159.7	231143	E006.9

TABLE 2–2
DATA AVAILABILITY ON–OFF TIMES
30 NOVEMBER 1976

INT ORBIT AND STDN	HDR	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	LR IR	TH IR	TDRF	SAM	SER	EBR	PMR	TWR	HIP S	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
7191C	B	0027	0132					X	X	Y	X		7191	000535	E173.4	005914	W020.0
7193R	B	0147	0251		X			X	X	Y	X		7192	015306	E146.5	024646	W046.9
7194R	B	0458	0619		X			X	X	Y	X		7193	034038	E119.6	043418	W073.8
7195A	B	0638	0756		X			X	X	Y	X		7194	052810	E092.8	062150	W100.7
7199A	B	0823	0927		X			X	X	Y	X		7195	071541	E065.9	080921	W127.6
7200A	B	1523	1645		X			X	X	Y	X		7196	090313	E039.0	095653	W154.4
7201A	B	1708	1830		X			X	X	Y	X		7197	105045	E012.1	114425	E178.7
7202A	B	1855	2015		X			X	X	Y	X		7198	123817	W014.8	133157	E151.8
7203A	B	2042	2203		X			X	X	Y	X		7199	142548	W041.7	151928	E124.9
													7200	161320	W068.6	170700	E098.0
													7201	180052	W095.4	185432	E071.2
													7202	194824	W122.3	204204	E044.3
													7203	213555	W149.2	222935	E017.4
													7204	232327	W176.1	001707	W009.5

TABLE 2–2
DATA AVAILABILITY ON–OFF TIMES
01 DECEMBER 1976

INT ORBIT AND STDN	H D R S	HDRSS TIME ON HRMN	OFF HRMN	L R I R	T H I R	T D R F	S C A M	E S E R	P M R P	T W R L	H I R S	DATA ORBIT	ASCENDING NODE TIME HRMNSS	LONG DEGREE	DESCENDING NODE TIME HRMNSS	LONG DEGREE
7204C	B	2346	0050				X	X	Y	X		7205	011059	E157.0	020439	W036.4
7205C	B	0104	0208				X	X	Y	X		7206	025830	E130.2	035210	W063.3
7207R	B	0251	0538		X		X	X	Y	X		7207	044602	E103.3	053942	W090.1
7208R	B	0602	0722		X		X	X	Y	X		7208	063334	E076.4	072714	W117.0
7209A	B	0742	0903		X		X	X	Y	X		7209	082106	E049.5	091446	W143.9
7210A	B	0928	1051		X		X	X	Y	X		7210	100837	E022.6	110217	W170.8
7211A	B	1114	1237		X		X	X	Y	X		7211	115609	W004.3	124949	E162.3
7212A	B	1259	1421		X		X	X	Y	X		7212	134341	W031.1	143721	E135.5
7213A	B	1443	1604		X		X	X	Y	X		7213	153113	W058.0	162453	E108.6
7214A	B	1616	1749		X		X	X	Y	X		7214	171844	W084.9	181224	E081.7
7215A	B	1812	1935		X		X	X	Y	X		7215	190616	W111.8	195956	E054.8
7216A	B	2000	2121		X		X	X	Y	X		7216	205348	W138.7	214728	E027.9
7217A	B	2147	2307		X		X	X	Y	X		7217	224120	W165.6	233500	E001.0

TABLE 2–2
DATA AVAILABILITY ON–OFF TIMES
02 DECEMBER 1976

INT ORBIT AND STDN	H D R S	HDRSS TIME ON HRMN	OFF HRMN	L R I R	T H I R	T D R F	S C A M	E S E R	P M R P	T W R L	H I R S	DATA ORBIT	ASCENDING NODE TIME HRMNSS	LONG DEGREE	DESCENDING NODE TIME HRMNSS	LONG DEGREE
7218C	B	0050	0155				X	Y	X	X		7218	002651	E167.6	012231	W025.9
7220R	B	0221	0455		X		X	X	Y	X		7219	021623	E140.7	031003	W052.7
7221R	B	0520	0642		X		X	X	Y	X		7220	040355	E113.8	045735	W079.6
7222A	B	0700	0820		X		X	X	Y	X		7221	055126	E086.9	064507	W106.5
7223A	B	0847	1007		X		X	X	Y	X		7222	073858	E060.0	083238	W133.4
7224A	B	1032	1155		X		X	X	Y	X		7223	092630	E033.2	102010	W160.3
7225A	B	1218	1340		X		X	X	Y	X		7224	111402	E006.3	120742	E172.9
7226A	B	1402	1523		X		X	X	Y	X		7225	130133	W020.6	135513	E146.0
7227A	B	1547	1708		X		X	X	Y	X		7226	144905	W047.5	154245	E119.1
7228A	B	1731	1854		X		X	X	Y	X		7227	163637	W074.4	173017	E092.2
7229A	B	1918	2039		X		X	X	Y	X		7228	182408	W101.3	191749	E065.3
7230A	B	2104	2225		X		X	X	Y	X		7229	201140	W128.1	210520	E038.4
												7230	215912	W155.0	225252	E011.6
												7231	234644	E178.1	004024	W015.3

TABLE 2–2
DATA AVAILABILITY ON–OFF TIMES
03 DECEMBER 1976

INT ORBIT AND STDN	HDR STS	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	LR I R	TH R	TDRS F	SAMR	SER B	PM P	TWRL	HIR S	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
7233R	B	0254	0413		X		X	X	X	X		7232	013415	E151.2	022756	W042.2
7234R	B	0438	0601		X		X	X	X	X		7233	032147	E124.3	041527	W069.1
7235A	B	0619	0736		X		X	X	X	X		7234	050919	E097.5	060259	W096.0
7236A	B	0804	0926		X		X	X	X	X		7235	065651	E070.6	075031	W122.9
7237A	B	0951	1113		X		X	X	X	X		7236	084422	E043.7	093803	W149.7
7238A	B	1136	1259		X		X	X	X	X		7237	103154	E016.8	112534	W176.6
7239A	B	1322	1443		X		X	X	X	X		7238	121926	W010.1	131306	E156.5
7240A	B	1506	1626		X		X	X	X	X		7239	140657	W037.0	150038	E129.6
7241A	B	1650	1812		X		X	X	X	X		7240	155429	W063.9	164810	E102.7
7242A	B	1835	1957		X		X	X	X	X		7241	174203	W090.7	183541	E075.9
7243A	B	2023	2144		X		X	X	X	X		7242	192933	W117.6	202313	E049.0
7244A	B	2211	2331		X		X	X	X	X		7243	211704	W144.5	221045	E022.1
												7244	230436	W171.4	235816	W004.8

TABLE 2–2
DATA AVAILABILITY ON–OFF TIMES
04 DECEMBER 1976

INT ORBIT AND STDN	HDR STS	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	LR I R	TH R	TDRS F	SAMR	SER B	PM P	TWRL	HIR S	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
7244C	B	2327	0018				X	X	X	X		7245	005208	E161.7	014548	W031.7
7245C	B	0046	0150				X	X	X	X		7246	023940	E134.9	033320	W058.6
7247R	B	0235	0518		X		X	X	X	X		7247	042711	E108.0	052052	W085.5
7248R	B	0543	0703		X		X	X	X	X		7248	061443	E081.1	070823	W112.3
7249A	B	0723	0843		X		X	X	X	X		7249	080215	E054.2	085555	W139.2
7250A	B	0910	1032		X		X	X	X	X		7250	094946	E027.3	104327	W166.1
7251A	B	1055	1219		X		X	X	X	X		7251	113718	E000.4	123059	E167.0
7252A	B	1242	1401		X		X	X	X	X		7252	132450	W026.4	141830	E140.1
7253A	B	1425	1546		X		X	X	X	X		7253	151222	W053.3	160602	E113.3
7254A	B	1608	1731		X		X	X	X	X		7254	165953	W080.2	175334	E086.4
7255A	B	1754	1916		X		X	X	X	X		7255	184725	W107.1	194106	E059.5
7256A	B	1942	2103		X		X	X	X	X		7256	203457	W134.0	212837	E032.6
7257A	B	2128	2249		X		X	X	X	X		7257	222229	W160.9	231609	E005.7

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TABLE 2–2
DATA AVAILABILITY ON–OFF TIMES
05 DECEMBER 1976

INT ORBIT AND STDN	H D R S	HDRSS TIME ON HRMN	OFF HRMN	L R I R	T H I R	T D R E	C A M	E S M R	E R B	P M	T W L	H I R S	DATA ORBIT	ASCENDING NODE TIME HRMNSS	LONG DEGREE	DESCENDING NODE TIME HRMNSS	LONG DEGREE
72580	B	0031	0136					X	X	Y	X		7258	001906	E172.3	010346	W021.2
7259C	B	0152	0256					X	X	Y	X		7259	015737	E145.4	025118	W048.1
7260R	B	0335	0421		X			X	X	Y	X		7260	034509	E118.5	043850	W074.9
7261R	B	0502	0624		X			X	X	Y	X		7261	053241	E091.6	062621	W101.8
7262A	B	0642	0800		X			X	X	Y	X		7262	072013	E064.7	081353	W128.7
7263A	B	0827	0949		X			X	X	Y	X		7263	090744	E037.8	100125	W155.6
7264A	B	1014	1136		X			X	X	Y	X		7264	105516	E011.0	114857	E177.5
7265A	B	1159	1322		X			X	X	Y	X		7265	124248	W015.9	133628	E150.7
7266A	B	1344	1506		X			X	X	Y	X		7266	143020	W042.8	152400	E123.8
7267A	B	1528	1649		X			X	X	Y	X		7267	161751	W069.7	171132	E096.9
7268A	B	1712	1835		X			X	X	Y	X		7268	180523	W096.6	185904	E070.0
7269A	B	1859	1649		X			X	X	Y	X		7269	195255	W123.5	204635	E043.1
7270A	B	2047	2207		X			X	X	Y	X		7270	214027	W150.3	223407	E016.2
													7271	232758	W177.2	002139	W010.6

TABLE 2–2
DATA AVAILABILITY ON–OFF TIMES
06 DECEMBER 1976

INT ORBIT AND STDN	H D R S	HDRSS TIME ON HRMN	OFF HRMN	L R I R	T H I R	T D R E	C A M	E S M R	E R B	P M	T W L	H I R S	DATA ORBIT	ASCENDING NODE TIME HRMNSS	LONG DEGREE	DESCENDING NODE TIME HRMNSS	LONG DEGREE
7271C	B	2350	0054					X	X	Y	X		7272	011530	E155.9	020911	W037.5
7274R	B	0255	0541		X			X	X	Y	X		7273	030302	E129.0	035642	W064.6
7275A	B	0602	0717		X			X	X	Y	X		7274	045034	E102.1	054414	W091.3
7276A	B	0746	0907		X			X	X	Y	X		7275	063805	E075.3	073146	W118.2
7277A	B	0933	1055		X			X	X	Y	X		7276	082537	E048.4	091918	W145.1
7278A	B	1118	1240		X			X	X	Y	X		7277	101309	E021.5	110649	W171.9
7279A	B	1303	1425		X			X	X	Y	X		7278	120040	W005.4	125421	E161.2
7280A	B	1447	1608		X			X	X	Y	X		7279	134812	W032.3	144153	E134.3
7282A	B	1816	1939		X			X	X	Y	X		7280	153544	W059.2	162925	E107.4
7283A	B	2004	2126		X			X	X	Y	X		7281	172316	W086.1	181656	E080.5
7284A	B	2151	2312		X			X	X	Y	X		7282	191047	W112.9	200428	E053.7
													7283	205819	W139.8	215200	E026.8
													7284	224551	W166.7	233932	W002.1

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TABLE 2–2
DATA AVAILABILITY ON–OFF TIMES
07 DECEMBER 1976

INT RBIT AND STDN	HDR	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	LR IR	TH IR	TDRF	SC MR	SE MR	SE RR	PM RP	TWR LR	HR IR	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
7284C	B	2311	0016				X	X	X	X			7285	003323	E166.4	012704	W027.0
7285C	B	0026	0130				X	X	X	X			7286	022054	E139.5	031435	W053.9
7287R	B	0215	0459		X		X	X	X	X			7287	040826	E112.7	050207	W080.8
7288R	B	0524	0646		X	X	X	X	X	X			7288	055558	E085.8	064939	W107.7
7289A	B	0706	0824		X	X		X	X	X			7289	074330	E058.9	083711	W134.5
7290A	B	0851	1013		X	X		X	X	X			7290	093101	E032.0	102442	W161.4
7291A	B	1036	1159		X	X		X	X	X			7291	111833	E005.1	121214	E171.7
7292A	B	1222	1344		X	X		X	X	X			7292	130605	W021.8	135946	E144.8
7293A	B	1408	1528		X	X		X	X	X			7293	145337	W048.6	154718	E117.9
7294A	B	1551	1712		X	X		X	X	X			7294	164108	W075.5	173449	E091.1
7295A	B	1735	1858		X	X		X	X	X			7295	182840	W102.4	192221	E064.2
7296A	B	1923	2043		X	X		X	X	X			7296	201612	W129.3	210953	E037.3
7297A		2110	2230		X	X		X	X	X			7297	220344	W156.2	225725	E010.4
													7298	235115	E177.0	004456	W016.5

TABLE 2–2
DATA AVAILABILITY ON–OFF TIMES
08 DECEMBER 1976

INT RBIT AND STDN	HDR	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	LR IR	TH IR	TDRF	SC MR	SE MR	SE RR	PM RP	TWR LR	HR IR	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
7298C	B	0014	0118			X		X	X	X			7299	013647	E150.1	023228	W043.4
7299C	B	0132	0234			X		X	X	X			7300	032619	E123.2	042000	W070.2
7300R	B	0314	0417		X	X		X	X	X			7301	051351	E096.3	060732	W097.1
7301R	B	0442	0605		X	X		X	X	X			7302	070122	E069.4	075503	W124.0
7302A	B	0624	0740		X	X		X	X	X			7303	084854	E042.5	094235	W150.9
7303A	B	0808	0930		X	X		X	X	X			7304	103626	E015.7	113007	W177.8
7304A	B	0955	1118		X	X		X	X	X			7305	122358	W011.2	131739	E155.3
7305A	B	1142	1301		X	X		X	X	X			7306	141129	W038.1	150510	E128.5
7306A	B	1326	1447		X	X		X	X	X			7307	155901	W065.0	165242	E101.6
7307A	B	1509	1631		X	X		X	X	X			7308	174633	W091.9	184014	E074.7
7309A	B	1839	2002		X	X		X	X	X			7309	193405	E118.8	202746	E047.8
7310A	B	2027	2148		X	X		X	X	X			7310	212136	W145.7	221518	E020.9
7311A	B	2216	2333		X	X		X	X	X			7311	230908	W172.5	000249	W006.0

TABLE 2–2
DATA AVAILABILITY ON–OFF TIMES
09 DECEMBER 1976

INT ORBIT AND STDN	HDRS	TIME	LRI	THR	TDRE	SCAMR	SEMRS	EPHEM	TWRP	THIS	ASCENDING NODE DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
	R	ON	OFF												
	S	HRMN	HRMN												
7311C	B	2332	0036		X			X	X	X	7312	005640	E160.6	015021	W032.8
7312C	B	0051	0156		X			X	X	X	7313	024412	E133.7	033753	W059.7
7314R	B	0400	0521	X			X	X	X	X	7314	043143	E106.8	052525	W086.6
7315R	B	0548	0702	X			X	X	X	X	7315	061915	E079.9	071256	W113.5
7316A	B	0727	0848	X			X	X	X	X	7316	080647	E053.1	090028	W140.4
7317A	B	0913	1037	X			X	X	X	X	7317	095419	E026.2	104800	W167.3
7318A	B	1059	1223	X			X	X	X	X	7318	114150	W000.7	123532	E165.9
7319A	B	1245	1403	X			X	X	X	X	7319	132922	W027.6	142303	E139.0
7320A	B	1429	1550	X			X	X	X	X	7320	151654	W054.5	161035	E112.1
7321A	B	1613	1735	X			X	X	X	X	7321	170426	W081.4	175807	E085.2
7322A	B	1758	1920	X			X	X	X	X	7322	185157	W108.2	194539	E058.3
7323A	B	1947	2106	X			X	X	X	X	7323	203929	W135.1	213310	E031.5
7324A	B	2133	2253	X			X	X	X	X	7324	222701	W162.0	232042	E004.6

TABLE 2–2
DATA AVAILABILITY ON–OFF TIMES
10 DECEMBER 1976

INT ORBIT AND STDN	HDRS	TIME	LRI	THR	TDRE	SCAMR	SEMRS	EPHEM	TWRP	THIS	ASCENDING NODE DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
	R	ON	OFF												
	S	HRMN	HRMN												
7327R	B	0320	0436	X			X	X	X	X	7325	001433	E171.1	010814	W022.3
7328R	B	0506	0627	X			X	X	X	X	7326	020204	E144.2	025546	W049.2
7329A	B	0646	0804	X			X	X	X	X	7327	034936	E117.4	044317	W076.1
7330A	B	0832	0954	X			X	X	X	X	7328	053708	E090.5	063049	W103.0
7331A	B	1018	1141	X			X	X	X	X	7329	072440	E063.6	081821	W129.8
7332A	B	1204	1319	X			X	X	X	X	7330	091211	E036.7	100553	W156.7
7333A	B	1349	1510	X			X	X	X	X	7331	105943	E009.8	115324	E176.4
7334A	B	1534	1651	X			X	X	X	X	7332	124715	W017.1	134056	E149.5
7335A	B	1716	1839	X			X	X	X	X	7333	143447	W043.9	152828	E122.6
7336A	B	1903	2025	X			X	X	X	X	7334	162218	W070.8	171600	E095.8
7337A	B	2051	2209	X			X	X	X	X	7335	180950	W097.7	190331	E068.9
7338C	B	2247	2351				X	X	X	X	7336	195722	W124.6	205103	E042.0
											7337	214454	W151.5	223835	E015.1
											7338	233225	W178.4	002607	W011.8

TABLE 2–2
DATA AVAILABILITY ON–OFF TIMES
11 DECEMBER 1976

INT ORBIT AND STDN	HDRS DATA SRS	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	LR IR	TH IR	TD IR	TC AM	ES MR	ES AR	EP MR	TW RL	TH RS	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
7339C	B	0113	0216					X	X	Y	X		7339	011957	E154.8	021338	W038.7
7340R	B	0255	0327		X			X	X	Y	X		7340	030729	E127.9	040110	W065.5
7341R	B	0423	0546		X			X	X	Y	X		7341	045501	E101.0	054842	W092.4
7342A	B	0605	0720		X			X	X	Y	X		7342	064232	E074.1	073614	W119.3
7343A	B	0751	0912		X			X	X	Y	X		7343	083004	E047.2	092346	W146.2
7344A	B	0936	1059		X			X	X	Y	X		7344	101736	E020.4	111117	W173.1
7345A	B	1123	1245		X			X	X	Y	X		7345	120508	W006.5	125849	E160.1
7346A	B	1307	1419		X			X	X	Y	X		7346	135239	W033.4	144621	E133.2
7347A	B	1451	1612		X			X	X	Y	X		7347	154011	W060.3	163353	E106.3
7348A	B	1635	1758		X			X	X	Y	X		7348	172743	W087.2	182124	E079.4
7349A	B	1821	1943		X			X	X	Y	X		7349	191515	W114.1	200856	E052.5
7350A	B	2009	2130		X			X	X	Y	X		7350	210246	W141.0	215628	E025.6
7351A	B	2156	2315		X			X	X	Y	X		7351	225018	W167.8	234400	W001.3

TABLE 2–2
DATA AVAILABILITY ON–OFF TIMES
12 DECEMBER 1976

INT ORBIT AND STDN	HDRS DATA SRS	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	LR IR	TH IR	TD IR	TC AM	ES MR	ES AR	EP MR	TW RL	TH RS	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
7351C	B	2313	0016					X	X	Y	X		7352	003748	E165.3	013130	W028.1
7352C	B	0031	0133					X	X	Y	X		7353	022520	E138.4	031902	W055.0
7354R	B	0343	0503		X			X	X	Y	X		7354	041252	E111.5	050633	W081.9
7355R	B	0528	0650		X			X	X	Y	X		7355	060024	E084.6	065405	W108.8
7356A	B	0710	0815		X			X	X	Y	X		7356	074755	E057.8	084137	W135.7
7357A	B	0855	1017		X			X	X	Y	X		7357	093527	E030.9	102909	W162.5
7358A	B	1041	1204		X			X	X	Y	X		7358	112259	E004.0	121640	W170.6
7359A	B	1228	1345		X	X			X	Y	X		7359	131031	W022.9	140412	E143.7
7360A	B	1411	1532		X	X			X	Y	X		7360	145802	W049.8	155144	E116.8
7361A	B	1555	1715		X	X			X	Y	X		7361	164534	W076.7	173916	E089.9
7362A	B	1738	1900		X	X			X	Y	X		7362	183306	W103.5	192647	E063.1
7363A	B	1927	2048		X	X			X	Y	X		7363	202037	W130.4	211419	E036.2
7364A	B	2132	2234		X	X			X	Y	X		7364	220809	W157.3	230151	E009.3
7365A	B	2307	0019		X	X			X	Y	X		7365	235541	E175.8	004923	W017.6

TABLE 2–2
DATA AVAILABILITY ON–OFF TIMES
13 DECEMBER 1976

ORBIT NO	HDR DATA SRS	TIME ON HRMN	TIME OFF HRMN	LRI	THR	TDRS F	CAMERA	SEM REC	FPM REC	TWR LOS	HDR INTR	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
365C	B	0017	0116			X		X	X	X		7366	014313	E148.0	023654	W044.5
366C	B	0134	0238			X		X	X	X		7367	033044	E122.1	042426	W071.4
367R	B	0317	0422		X	X		X	X	X		7368	051516	E095.2	061158	W098.3
368R	B	0447	0609		X	X		X	X	X		7369	070548	E068.3	075930	W125.1
369A	B	0628	0745		X	X		X	X	X		7370	085320	E041.4	094701	W152.0
370A	B	0813	0935		X	X		X	X	X		7371	104051	E014.5	113433	W178.9
371A	B	0959	1122		X	X		X	X	X		7372	122823	W012.4	132205	E154.2
372A	B	1145	1307		X	X		X	X	X		7373	141555	W039.2	150937	E127.3
373A	B	1331	1451		X	X		X	X	X		7374	160327	W066.1	165708	E100.5
374A	B	1514	1635		X	X		X	X	X		7375	175058	W093.0	184440	E073.6
375A	B	1658	1808		X	X		X	X	X		7376	193830	W119.9	203212	E046.7
376A	B	1844	2006		X	X		X	X	X		7377	212602	W146.8	221944	E019.8
377A	B	2032	2153		X	X		X	X	X		7378	231334	W173.7	000715	W007.1
378A	B	2220	2339		X	X		X	X	X						

TABLE 2–2
DATA AVAILABILITY ON–OFF TIMES
14 DECEMBER 1976

ORBIT NO	HDR DATA SRS	TIME ON HRMN	TIME OFF HRMN	LRI	THR	TDRS F	CAMERA	SEM REC	FPM REC	TWR LOS	HDR INTR	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
378C	B	2353	0039			X		X	X	X		7379	010105	E159.5	015447	W034.0
379C	B	0052	0157			X		X	X	X		7380	024837	E132.6	034219	W061.9
381R	B	0406	0526		X	X		X	X	X		7381	043609	E105.7	052951	W087.7
382R	B	0552	0712		X	X		X	X	X		7382	062341	E078.8	071722	W114.6
383A	B	0732	0852		X	X		X	X	X		7383	081112	E051.9	090454	W141.5
384A	B	0919	1040		X	X		X	X	X		7384	095844	E025.1	105226	W168.4
385A	B	1104	1227		X	X		X	X	X		7385	114616	W001.8	123958	E164.7
386A	B	1250	1411		X	X		X	X	X		7386	133348	W028.7	142729	E137.9
387A	B	1435	1555		X	X		X	X	X		7387	152119	W055.6	161501	E111.0
388A	B	1619	1739		X	X		X	X	X		7388	170851	W082.5	180233	E084.1
389A	B	1803	1925		X	X		X	X	X		7389	185623	W109.4	195005	E057.2
390A	B	1950	2111		X	X		X	X	X		7390	204355	W136.3	213736	E030.3
391A	B	2137	2257		X	X		X	X	X		7391	223126	W163.1	232508	E003.5

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TABLE 2–2
DATA AVAILABILITY ON–OFF TIMES
15 DECEMBER 1976

INT ORBIT AND STTN	H D R S	HDRSS TIME ON HRMN	OFF HRMN	L R I R	T F I S	T D E	< C A	E S M	F R R	P M D	T W R L	U I R S	DATA ORBIT	ASCENDING NODE TIME HRMNSS	LONG DEGREE	DESCENDING NODE TIME HRMNSS	LONG DEGREE
7393C	R	2335	0038			X			X	Y	X		7392	001658	E170.0	011240	W023.4
7396A	B	0651	0810		Y	X			X	Y	X		7393	020630	E143.1	030011	W050.3
7397A	B	0836	0958		X	X			X	Y	X		7394	035402	E116.2	044743	W077.2
7398A	B	1023	1145		Y	X			X	Y	X		7395	054133	E089.3	063515	W104.1
7399A	B	1208	1331		X	X			X	Y	X		7396	072905	E062.5	082247	W131.0
7400A	B	1353	1514		X	X			X	Y	X		7397	091637	E035.6	101019	W157.9
7401A	B	1536	1658		X	X			X	Y	X		7398	110408	E008.7	115750	E175.3
7402A	B	1721	1844		X	X			X	Y	X		7399	125140	W018.2	134522	E148.4
7403A	B	1908	2029		X			X	X	Y	X		7400	143912	W045.1	153254	E121.5
7404A	B	2055	2216		X			X	X	Y	X		7401	162644	W072.0	172026	E094.6
7405A	B	2245	0002		X			X	X	Y	X		7402	181415	W098.8	190757	E067.7
													7403	200147	W125.7	205529	E040.9
													7404	214919	W152.6	224301	E014.0
													7405	233651	W179.5	003033	W012.9

TABLE 2–2
DATA AVAILABILITY ON–OFF TIMES
16 DECEMBER 1976

INT ORBIT AND STTN	H D R S	HDRSS TIME ON HRMN	OFF HRMN	L R I R	T F I S	T D E	< C A	E S M	F R R	P M D	T W R L	U I R S	DATA ORBIT	ASCENDING NODE TIME HRMNSS	LONG DEGREE	DESCENDING NODE TIME HRMNSS	LONG DEGREE
7405C	B	2359	0103					X	X	Y	X		7406	012422	E153.6	021804	W039.8
7407B	B	0117	0224		Y			X	X	Y	X		7407	031154	E126.8	040536	W066.7
7408B	B	0427	0551		X			X	X	Y	X		7408	045926	E099.9	055308	W093.6
7409B	B	0617	0733		Y			X	X	Y	X		7409	064656	E073.0	074040	W120.5
7410A	B	0754	0916		X			X	X	Y	X		7410	083429	E046.1	092811	W147.3
7411A	B	0941	1104		X			X	X	Y	X		7411	102201	E019.2	111543	W174.2
7412A	B	1127	1249		X			X	X	Y	X		7412	120933	W007.7	130315	E158.9
7413A	B	1311	1433		Y			Y	Y	Y	X		7413	135705	W034.6	145047	E132.0
7414A	B	1455	1600		X			X	X	Y	X		7414	154436	W061.4	163818	E105.2
7415A	B	1640	1802		X			Y	X	Y	X		7415	173208	W088.3	182550	E078.3
7416A	B	1826	1947		Y			X	X	Y	X		7416	191940	W115.2	201322	E051.4
7417A	B	2013	2134		X			Y	X	Y	X		7417	210712	W142.1	220054	E024.5
7418A	B	2202	2320		Y			X	X	Y	X		7418	225443	W169.0	234825	W002.4

TABLE 2–2
DATA AVAILABILITY ON–OFF TIMES
17 DECEMBER 1976

ANTENNA BEAM ID	HDR STATUS	HDRSS TIME ON	HDRSS TIME OFF	LR1	LR2	TDRS	SMR	SMA	SMD	TWL	THIS SAT	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
421R	B	0347	0508		X		X	X	Y	X		7419	004215	E164.2	013557	W029.3
422R	B	0533	0653		X		X	X	Y	X		7420	022947	E137.3	032329	W056.2
423A	B	0713	0833		X		X	X	Y	X		7421	041718	E110.4	051101	W083.0
424A	B	0859	1017		X		X	X	X	X		7422	060450	E083.5	065832	W109.9
425A	B	1045	1204		X		X	X	X	X		7423	075222	E056.6	084604	W136.8
426A	B	1231	1349		X		X	X	Y	X		7424	093954	E029.7	103336	W163.7
427A	B	1424	1533		X		X	X	Y			7425	112725	E002.9	122108	E169.4
428A	B	1559	1721		X		X	X	Y	X		7426	131457	W024.0	140839	E142.6
429A	B	1744	1906		X		X	X	Y	X		7427	150229	W050.9	155611	E115.7
430A	B	1931	2052		X		X	X	Y	X		7428	165001	W077.8	174343	E088.8
431A	B	2119	2239		X		X	X	Y	X		7429	183732	W104.7	193115	E061.9
432A	B	2310	0023		X		X	X	Y	X		7430	202504	W131.6	211846	E035.0
												7431	221236	W158.4	230618	E008.2

TABLE 2–2
DATA AVAILABILITY ON–OFF TIMES
18 DECEMBER 1976

ANTENNA BEAM ID	HDR STATUS	HDRSS TIME ON	HDRSS TIME OFF	LR1	LR2	TDRS	SMR	SMA	SMD	TWL	THIS SAT	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
432C	B	0023	0127				X	X	Y	X		7432	000008	E174.7	005350	W018.7
433C	B	0140	0317				X	X	Y	X		7433	014739	E147.8	024122	W045.6
434R	B	0322	0423		X		X	X	Y	X		7434	033511	E121.9	042853	W072.5
435R	B	0451	0614		X		X	X	Y	X		7435	052243	E094.1	061625	W099.4
437A	B	0817	0939		X		X	X	Y	X		7436	071015	E067.2	080357	W126.3
438A	B	1004	1121		X		X	X	Y	X		7437	085746	E040.3	095129	W153.1
439A	B	1151	1308		X		X	X	Y	X		7438	104518	E013.4	113900	180.0
440A	B	1335	1456		X		X	X	Y	X		7439	123250	W013.5	132632	E153.1
441A	B	1519	1639		X		X	X	Y	X		7440	142022	W040.4	151404	E126.2
442A	B	1703	1825		X		X	X	Y	X		7441	160753	W067.3	170136	E099.3
443A	B	1848	2011		X		X	X	Y	X		7442	175525	W094.1	184907	E072.5
444A	B	2036	2157		X		X	X	Y	X		7443	194257	W121.0	203639	E045.6
445A	B	2225	2343		X		X	X	Y	X		7444	213029	W147.9	222411	E018.7
												7445	231800	W174.8	001143	W008.2

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TABLE 2–2
DATA AVAILABILITY ON–OFF TIMES
19 DECEMBER 1976

INT ORBIT AND STDN	HDRS		LR IR	TH IR	TD RF	SC AM	SE MR	ER BR	TW RL	HI RS	ASCENDING NODE DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
	HDR	TIME													
	S	ON HRMN	OFF HRMN												
7445C	B	2339	0043				X	X	X	X	7446	010529	E158.4	015911	W035.1
7446C	B	0059	0203				X	X	Y	X	7447	025301	E131.5	034643	W066.0
7448R	B	0409	0531		X		X	X	Y	X	7448	044032	E104.6	053415	W088.8
7449R	B	0556	0711		X		X	X	X	X	7449	062804	E077.7	072147	W115.7
7450A	B	0737	0857		X		X	X	X	X	7450	081536	E050.8	090918	W142.6
7451A	B	0923	1045		X		X	X	X	X	7451	100308	E023.9	105650	W169.5
7452A	B	1108	1224		X		X	X	X	X	7452	115039	W002.9	124422	E163.7
7453A	B	1255	1408		X		X	X	X	X	7453	133811	W029.8	143153	E136.8
7457A	B	1955	2113		X		X	X	X	X	7454	152543	W056.7	161925	E109.9
7458A	B	2141	2302		X		X	X	X	X	7455	171314	W083.6	180657	E083.0
											7456	190046	W110.5	195429	E056.1
											7457	204818	W137.3	214200	E029.2
											7458	223550	W164.2	232932	E002.3

TABLE 2–2
DATA AVAILABILITY ON–OFF TIMES
20 DECEMBER 1976

INT ORBIT AND STDN	HDRS		LR IR	TH IR	TD RF	SC AM	SE MR	ER BR	TW RL	HI RS	ASCENDING NODE DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
	HDR	TIME													
	S	ON HRMN	OFF HRMN												
7459C	B	2337	0041				X	X	X	X	7459	002321	E168.9	011704	W024.6
7460C	B	0206	0309				X	X	Y	X	7460	021053	E142.0	030436	W051.4
7461R	B	0345	0450		X		X	X	X	X	7461	035825	E115.1	045207	W078.3
7462R	B	0515	0636		X		X	X	X	X	7462	054557	E088.2	063939	W105.2
7463A	B	0655	0812		X		X	X	X	X	7463	073328	E061.4	082711	W132.1
7464A	B	0840	1003		X		X	X	Y	X	7464	092100	E034.5	101443	W159.0
7465A	B	1027	1149		X		X	X	Y	X	7465	110832	E007.6	120214	E174.2
7466A	B	1213	1335		X		X	X	Y	X	7466	125603	W019.3	134946	E147.3
7467A	B	1357	1518		X		X	X	X	X	7467	144335	W046.2	153718	E120.4
7468A	B	1540	1702		X		X	X	Y	X	7468	163107	W073.0	172449	E093.5
7469A	B	1725	1848		X		X	X	Y	X	7469	181840	W099.9	191221	E066.7
7470A	B	1912	2033		X		X	X	Y	X	7470	200610	W126.8	205953	E039.8
7471A	B	2059	2220		X		X	X	Y	X	7471	215342	W153.7	224725	E012.9
7472A	B	2251	0006		X		X	X	Y	X	7472	234114	E179.4	003456	W014.0

TABLE 2–2
DATA AVAILABILITY ON–OFF TIMES
21 DECEMBER 1976

INT RBIT AND STDN	H D R S	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	L R I R	T H R E	T D R E	S C A M	E S M R	E R B	P M R	T W R L	H I R S	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
7472C	B	0004	0108					X	X	X	X		7473	012845	E152.5	022228	W040.9
7473C	B	0124	0228					X	X	X	X		7474	031617	E125.7	041000	W067.8
7474R	B	0306	0404		X			X	X	X	X		7475	050349	E098.8	055732	W094.7
7475R	B	0432	0555		X			X	X	X	X		7476	065121	E071.9	074503	W121.5
7476R	B	0615	0737		X			X	X	X	X		7477	083852	E045.0	093235	W148.4
7477A	B	0759	0911		X			X	X	X	X		7478	102624	E018.1	112007	W175.3
7478A	B	0945	1105		X			X	X	X	X		7479	121356	W008.8	130739	E157.8
7479A	B	1131	1250		X			X	X	X	X		7480	140128	W035.7	145510	E130.9
7480A	B	1316	1437		X			X	X	X	X		7481	154859	W062.5	164242	E104.0
7481A	B	1501	1605		X			X	X	X	X		7482	173631	W089.4	183014	E077.2
7482A	B	1644	1806		X			X	X	X	X		7483	192403	W116.3	201745	E050.3
7483A	B	1829	1951		X			X	X	X	X		7484	211134	W143.2	220517	E023.4
7484A	B	2017	2139		X			X	X	X	X		7485	225906	W170.1	235249	W003.5
7485A	B	2205	2325		X			X	X	X	X						

TABLE 2–2
DATA AVAILABILITY ON–OFF TIMES
22 DECEMBER 1976

INT RBIT AND STDN	H D R S	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	L R I R	T H R E	T D R E	S C A M	E S M R	E R B	P M R	T W R L	H I R S	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
7485C	B	2320	0024					X	X	X	X		7486	004638	E163.1	014021	W030.4
7486C	B	0039	0143					X	X	X	X		7487	023410	E136.2	032752	W057.2
7488R	B	0351	0505		X			X	X	X	X		7488	042141	E109.3	051524	W084.1
7489R	B	0537	0658		X			X	X	X	X		7489	060913	E082.4	070256	W111.0
7490A	B	0718	0838		X			X	X	X	X		7490	075645	E055.6	085028	W137.9
7491A	B	0903	1025		X			X	X	X	X		7491	094416	E028.7	103759	W164.8
7492A	B	1049	1213		X			X	X	X	X		7492	113148	E001.8	122531	W168.3
7493A	B	1235	1357		X			X	X	X	X		7493	131920	W025.1	141303	E141.5
7494A	B	1421	1540		X			X	X	X	X		7494	150652	W052.0	160034	E114.6
7495A	B	1603	1725		X			X	X	X	X		7495	165423	W078.9	174806	E087.7
7496A	B	1748	1911		X			X	X	X	X		7496	184155	W105.8	193538	E060.8
7497A	B	1936	2057		X			X	X	X	X		7497	202927	W132.7	212310	E033.9
7498A	B	2123	2239		X			X	X	X	X		7498	221659	W159.5	231041	E007.0

TABLE 2–2
DATA AVAILABILITY ON–OFF TIMES
23 DECEMBER 1976

INT RBIT AND STDN	H D R S	HDRSS TIME ON HRMN	OFF HRMN	L R I R	T H R	T D R E	S C A M	E S M R	E R B	D M R	T W R L	H I R S	DATA ORBIT	ASCENDING NODE TIME HRMNSS	LONG DEGREE	DESCENDING NODE TIME HRMNSS	LONG DEGREE
7499C	B	2319	0023					X	X	X	X		7490	000430	E173.6	005813	W019.9
7500C	B	0145	0249					X	X	Y	X		7500	015202	E146.7	024545	W046.7
7501R	B	0328	0424		X			X	X	Y	X		7501	033934	E119.8	043317	W073.6
7502R	B	0455	0618		X			X	X	Y	X		7502	052705	E092.9	062048	W100.5
7503A	B	0636	0755		X			X	X	Y	X		7503	071437	E066.1	080820	W127.4
7504A	B	0823	0943		X			X	X	X	X		7504	090209	E039.2	095552	W154.2
7505A	B	1008	1131		X			X	X	X	X		7505	104941	E012.3	114324	E178.9
7506A	B	1155	1317		X			X	X	Y	X		7506	123712	W014.6	133055	E152.0
7507A	B	1339	1458		X			X	X	X	X		7507	142444	W041.5	151827	E125.1
7508A	B	1523	1643		X			X	X	X	X		7508	161216	W068.4	170559	E098.2
7509A	B	1707	1829		X			X	X	X	X		7509	175947	W095.2	185330	E071.3
7510A	B	1853	2014		X			X	X	X	X		7510	194719	W122.1	204102	E044.5
7511A	B	2040	2202		X			X	X	X	X		7511	213451	W149.0	222834	E017.6
7512A	B	2231	2347		X			X	X	X	X		7512	232221	W175.9	001606	W009.3

TABLE 2–2
DATA AVAILABILITY ON–OFF TIMES
24 DECEMBER 1976

INT RBIT AND STDN	H D R S	HDRSS TIME ON HRMN	OFF HRMN	L R I R	T H R	T D R E	S C A M	E S M R	E R B	D M R	T W R L	H I R S	DATA ORBIT	ASCENDING NODE TIME HRMNSS	LONG DEGREE	DESCENDING NODE TIME HRMNSS	LONG DEGREE
7515R	B	0413	0535		X			X	X	X	X		7513	010954	E157.2	020337	W036.2
7516R	B	0601	0719		X			X	X	Y	X		7514	025726	E130.4	035109	W063.1
7517A	B	0740	0902		X			X	X	X	X		7515	044458	E103.5	053841	W090.0
7518A	B	0927	1049		X			X	X	Y	X		7516	063229	E076.6	072613	W116.9
7519A	B	1112	1236		X			X	X	X	X		7517	082001	E049.7	091344	W143.7
7520A	B	1259	1418		X			X	X	X	X		7518	100733	E022.8	110116	W170.6
7521A	B	1443	1602		X			X	X	X	X		7519	115505	W004.1	124848	E162.5
7522A	B	1625	1748		X			X	X	X	X		7520	134236	W030.9	143619	E135.6
7523A	B	1811	1933		X			X	X	X	X		7521	153008	W057.8	162351	E108.8
7524A	B	1959	2120		X			X	X	X	X		7522	171740	W084.7	181123	E081.9
7525A	B	2147	2305		X			X	X	X	X		7523	190512	W111.6	195855	E055.0
													7524	205243	W138.5	214626	E028.1
													7525	224015	W165.3	233358	E001.2

TABLE 2–2
DATA AVAILABILITY ON–OFF TIMES
25 DECEMBER 1976

INTERBIT AND STDN	HDR SYS	HDRSS TIME ON	HDRSS TIME OFF	LIR	THR	TDF	SCA	ESM	ESR	EPM	TWR	HIR	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
75260	B	2341	0045					X	X	X	X		7526	002747	E167.8	012130	W025.7
75270	B	0209	0313					X	X	X	X		7527	021518	E140.9	030902	W052.6
7528R	B	0519	0640		X			X	X	X	X		7528	040250	E114.0	045633	W079.4
7529R	B	0659	0818		X			X	X	X	X		7529	055022	E087.1	064405	W106.3
7530A	B	0845	1006		X			X	X	X	X		7530	073754	E060.2	083137	W133.2
7531A	B	1031	1154		X			X	X	X	X		7531	092525	E033.4	101908	W160.1
7532A	B	1217	1339		X			X	X	X	X		7532	111257	E006.5	120640	E173.0
7533A	B	1401	1520		X			X	X	X	X		7533	130029	W020.4	135412	E146.1
7535A	B	1545	1704		X			X	X	X	X		7534	144800	W047.3	154144	E119.3
7536A	B	1729	1850		X			X	X	X	X		7535	163532	W074.2	172915	E092.4
7537A	B	1917	2037		X			X	X	X	X		7536	182304	W101.1	191647	E065.5
7538A	B	2103	2225		X			X	X	X	X		7537	201036	W128.0	210419	E038.6
													7538	215807	W154.8	225151	E011.7
													7539	234539	E178.3	003922	W015.1

TABLE 2–2
DATA AVAILABILITY ON–OFF TIMES
26 DECEMBER 1976

INTERBIT AND STDN	HDR SYS	HDRSS TIME ON	HDRSS TIME OFF	LIR	THR	TDF	SCA	ESM	ESR	EPM	TWR	HIR	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
7539A	B	2255	0011		X			X	X	X	X		7540	013311	E151.4	022654	W042.0
75390	B	0009	0111					X	X	X	X		7541	032042	E124.5	041426	W068.9
7840C	B	0124	0227					X	X	X	X		7542	050814	E097.7	060157	W095.8
7541R	B	0308	0412		X			X	X	X	X		7543	065546	E070.8	074929	W122.7
7542R	B	0436	0559		X			X	X	X	X		7544	084318	E043.9	093701	W149.6
7543R	B	0627	0731		X			X	X	X	X		7545	103049	E017.0	112433	W176.4
7544A	B	0803	0925		X			X	X	X	X		7546	121821	W009.9	131204	E156.7
7545A	B	0949	1113		X			X	X	X	X		7547	140553	W036.8	145936	E129.8
7546A	B	1135	1257		X			X	X	X	X		7548	155324	W063.7	164708	E102.9
7547A	B	1320	1439		X			X	X	X	X		7549	174056	W090.5	183440	E076.0
7548A	B	1504	1624		X			X	X	X	X		7550	192828	W117.4	202211	E049.1
7549A	B	1648	1809		X			X	X	X	X		7551	211600	W144.3	220943	E022.3
7550A	B	1834	1956		X			X	X	X	X		7552	230331	W171.2	235715	W004.6
7552A	B	2023	2328		X			X	X	X	X						

TABLE 2–2
DATA AVAILABILITY ON–OFF TIMES
27 DECEMBER 1976

INT RBIT AND STDN	HDRS	TIME	LR	TH	TD	SC	ESM	ERB	PMR	TWR	HIR	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
	DR S	ON HRMN	OFF HRMN													
75520	B	2328	0030				X	X	X	X		7553	005103	E161.9	014446	W031.5
75530	B	0042	0145				X	X	X	X		7554	023835	E135.0	033218	W058.4
7555R	B	0228	0517		X		X	X	X	X		7555	042607	E108.2	051950	W085.3
7556R	B	0557	0658		X		X	X	X	X		7556	061338	E081.3	070722	W112.1
7557A	B	0722	0843		X		X	X	X	X		7557	080110	E054.4	085453	W139.0
7558A	B	0908	1030		X		X	X	X	X		7558	094842	E027.5	104225	W165.9
7559A	B	1055	1217		X		X	X	X	X		7559	113613	E000.6	122957	E167.2
7560A	B	1240	1401		X		X	X	X	X		7560	132345	W026.3	141729	E140.3
7561A	B	1424	1545		X		X	X	X	X		7561	151117	W053.1	160500	E113.4
7562A	B	1607	1727		X		X	X	X	X		7562	165849	W080.0	175232	E086.6
7563A	B	1753	1915		X		X	X	X	X		7563	184620	W106.9	194004	E059.7
7564A	B	1942	2059		X		X	X	X	X		7564	203352	W133.8	212735	E032.8
7565A	B	2129	2247		X		X	X	X	X		7565	222124	W160.7	231507	E005.9

TABLE 2–2
DATA AVAILABILITY ON–OFF TIMES
28 DECEMBER 1976

INT RBIT AND STDN	HDRS	TIME	LR	TH	TD	SC	ESM	ERB	PMR	TWR	HIR	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
	DR S	ON HRMN	OFF HRMN													
7566C	B	0031	0134				X	X	X	X		7566	000900	E172.5	010243	W021.0
75670	B	0148	0252				X	X	X	X		7567	015632	E145.6	025015	W047.9
7568R	B	0336	0436		X		X	X	X	X		7568	034403	E118.7	043747	W074.8
7569R	B	0500	0622		X		X	X	X	X		7569	053135	E091.8	062519	W101.6
7570A	B	0641	0800		X		X	X	X	X		7570	071907	E064.9	081250	W128.5
7571A	B	0827	0946		X		X	X	X	X		7571	090639	E038.0	100022	W155.4
7572A	B	1012	1135		X		X	X	X	X		7572	105410	E011.2	114754	E177.7
7573A	B	1159	1321		X		X	X	X	X		7573	124142	W015.7	133526	E150.9
7574A	B	1343	1505		X		X	X	X	X		7574	142914	W042.6	152257	E124.0
7575A	B	1527	1649		X		X	X	X	X		7575	161646	W069.5	171029	E097.1
7576A	B	1711	1834		X		X	X	X	X		7576	180417	W096.4	185801	E070.2
7577A	B	1857	2020		X		X	X	X	X		7577	195149	W123.3	204533	E043.3
7578A	B	2045	2206		X		X	X	X	X		7578	213921	W150.2	223304	W016.4
												7579	232653	W177.1	002036	W010.1

TABLE 2–2
DATA AVAILABILITY ON–OFF TIMES
29 DECEMBER 1976

INT ORBIT AND STDN	H D R S	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	L R I R	T H I R	T D R E	S C A M	E S M R	E R B	P M R	T W R L	H I R S	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
75790	B	2349	0053					X	X	X	X		7580	011424	E156.1	020808	W037.4
7580C	B	0105	0209					X	X	X	X		7581	030156	E129.2	035540	W064.2
7582R	B	0252	0356		X			X	X	X	X		7582	044928	E102.3	054311	W091.1
7583R	B	0605	0724		X			X	X	X	X		7583	063659	E075.5	073043	W118.0
7584A	B	0745	0907		X			X	X	X	X		7584	082431	E048.6	091815	W144.9
7585A	B	0931	1053		X			X	X	X	X		7585	101203	E021.7	110547	W171.8
7586A	B	1117	1240		X			X	X	X	X		7586	115935	W005.2	125318	E161.4
7587A	B	1303	1424		X			X	X	X	X		7587	134706	W032.1	144050	E134.5
7588A	B	1447	1608		X			X	X	X	X		7588	153438	W059.0	162822	E107.6
7589A	B	1631	1752		X			X	X	X	X		7589	172210	W085.9	181554	E080.7
7590A	B	1815	1939		X			X	X	X	X		7590	190942	W112.8	200325	E053.8
7591A	B	2003	2125		X			X	X	X	X		7591	205713	W139.6	215057	E026.9
7592A	B	2151	2310		X			X	X	X	X		7592	224445	W166.5	233829	E000.1

TABLE 2–2
DATA AVAILABILITY ON–OFF TIMES
30 DECEMBER 1976

INT ORBIT AND STDN	H D R S	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	L R I R	T H I R	T D R E	S C A M	E S M R	E R B	P M R	T W R L	H I R S	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
7592C	B	2311	0014					X	X	X	X		7593	003217	E166.6	012601	W026.8
7593C	B	0024	0123					X	X	X	X		7594	021949	E139.7	031332	W053.7
7595R	B	0208	0311		X			X	X	X	X		7595	040720	E112.8	050104	W080.6
7596R	B	0523	0628		X			X	X	X	X		7596	055452	E086.0	064836	W107.5
7597A	B	0704	0824		X			X	X	X	X		7597	074224	E059.1	083608	W134.4
7598A	B	0849	1011		X			X	X	X	X		7598	092956	E032.2	102339	W161.2
7599A	B	1035	1159		X			X	X	X	X		7599	111727	E005.3	121111	E171.9
7600A	B	1221	1343		X			X	X	X	X		7600	130459	W021.6	135843	E145.0
7601A	B	1407	1524		X			X	X	X	X		7601	145231	W048.5	154615	E118.1
7602A	B	1549	1711		X			X	X	X	X		7602	164002	W075.3	173346	E091.2
7603A	B	1735	1857		X			X	X	X	X		7603	182734	W102.2	192118	E064.4
7604A	B	1921	2043		X			X	X	X	X		7604	201506	W129.1	210850	E037.5
7605A	B	2108	2227		X			X	X	X	X		7605	220238	W156.0	225622	E010.6
													7606	235009	E177.1	004353	W016.3

TABLE 2–2
DATA AVAILABILITY ON–OFF TIMES
31 DECEMBER 1976

INT ORBIT AND STON	HDRS	HDRSS TIME ON HRMN	HDRSS TIME OFF HRMN	LR IR	TH IR	TD IR	SC AM	FS MR	ER BR	PM RR	TW RL	HR IS	DATA ORBIT	ASCENDING NODE TIME HRMNSS	ASCENDING NODE LONG DEGREE	DESCENDING NODE TIME HRMNSS	DESCENDING NODE LONG DEGREE
7608R	B	0259	0416		X			X	X	X	X		7607	013741	E150.3	023125	W043.2
7609R	B	0441	0545		X			X	X	X	X		7608	032513	E123.4	041657	W070.1
7610A	B	0623	0739		X			X	X	X	X		7609	051245	E096.5	060628	W096.9
7611A	B	0808	0929		X			X	X	X	X		7610	070016	E069.6	075400	W123.8
7612A	B	0955	1117		X			X	X	X	X		7611	084748	E042.7	094132	W150.7
7613A	B	1140	1302		X			X	X	X	X		7612	103520	E015.8	112904	W177.6
7614A	B	1315	1446		X			X	X	X	X		7613	122252	W011.0	131635	E155.5
7615A	B	1503	1629		X			X	X	X	X		7614	141023	W038.0	150407	E128.7
7616A	B	1649	1816		X			X	X	X	X		7615	155755	W064.8	165139	E101.8
7617A	B	1839	2000		X			X	X	X	X		7616	174527	W091.7	183911	E074.9
7618A	B	2027	2147		X			X	X	X	X		7617	193258	W118.6	202642	E048.0
7619A	B	2215	2333		X			X	X	X	X		7618	212030	W145.5	221414	E021.1
													7619	230802	W172.3	000146	W005.8

SECTION 3

ORBIT DISPLAYS OF ESMR

This section briefly describes the ESMR experiment, the format of the image displays derived from the data of this experiment and presents image examples of selected data. A complete description of the ESMR experiment is found in Section 5 of The Nimbus 6 User's Guide.

The ESMR is a two-channel scanning radiometer receiving microwave radiation in a 250 MHz band centered at 37 GHz. One channel is used to measure the vertical polarization of the radiation, and the other measures the horizontal polarization. The antenna beam scans ahead of the spacecraft along a conical surface with a constant angle of 45 degrees with respect to the antenna axis. Spatial resolution of each element is about 20 km in the cross-track direction by 45 km in the direction parallel to the subpoint track.

For a brief description of the HIRS and SCAMS experiments formerly described in this Section, see The Nimbus 6 Data Catalog, Volume 5, Section 3. A complete description of the HIRS and SCAMS experiments may be found in The Nimbus 6 User's Guide, Sections 3 and 4 respectively.

All useable HIRS and SCAMS data have been converted to 4" x 5" black and white images. ESMR data will continue to be converted to 4" x 5" black and white images as long as the experiment continues to function in an operational mode. Selected images from the ESMR experiment for September and October 1976 are presented in this section. Complete coverage times are listed in the Data Availability ON-OFF Times in Table 2-2.

Section 5 of The Nimbus 6 User's Guide describes in detail the image format of the ESMR. The following is a summary of the format, detailing changes to the User's Guide where needed. The processed display contains the following items:

- NIMBUS 6 (ESMR)

 This identifies the satellite and the experiment.

- (DATE)

 This identifies the Greenwich month, day, and year the data were recorded on board the satellite.

- SCALE F (P2)

 Since orbit 3933, ESMR has operated in the P (partial mode). For each experiment the data from each interrogation orbit is displayed on a single

image. Through orbit 3932 (31 March 1976), each ESMR scan line is displayed once and twice after orbit 3932. Similarly, each of the 71 scan-spot elements is displayed once through orbit 3932 and twice after orbit 3933.

- INT ORBIT

The interrogation orbit number identifies the orbit in progress when the recorded data is transmitted to a STDN station. Usually parts of two data orbits are on the same display. The interrogation orbit number will only identify the last orbit of each display.

- TIME (and) SUBPOINT

Satellite time and latitude-longitude information are presented along the vertical line down the center of each display. The line represents the satellite subpoint track, which is located down the center of each of the swaths on each display. Time is GMT with ticks along the left side of the line at each five minute mark (on the five minutes). Time is annotated (hour and minute) every 15 minutes (on the quarter hour).

Subpoint information presents latitude and longitude positions of the satellite subpoint. Each tick mark on the right side of the vertical line is annotated with the subpoint latitude and longitude (to the nearest degree). Latitude is labeled N (north) or S (south). Longitude is labeled E (east) or W (west).

After orbit 3933 and again at orbit 6185, the ESMR data display was changed. The following condensed changes apply for TIME and SUBPOINT information: Satellite time information is presented along the vertical lines to the left and to the right of the data display. Time is GMT with 5 minute ticks marks. Time annotations consist of hour-minute displays with 15 minute intervals or quarter-hour notations.

Latitude and longitude coordinates are in grid form centrally placed between two sets of data; each data set are a compliment of the appropriate grid overlay immediately adjacent to its border. For a complete description of new format see ESMR CHANNEL-RANGE DISPLAYS, this section of the catalog.

- GRAY SCALE

Each image has an 18-step gray scale along the bottom of the display. The gray scales are used to define parameter value intervals for each image swath of each display by assigning different parameter values to the gray scale for each swath. Tables 3-1 through 3-3 define the parameter values versus gray scale for each ESMR image swath.

Table 3-1

Brightness Temperature Value for each Step of the Gray Scale on ESMR Image Displays for Orbits 828 through 3932 (13 August 1975 through 31 March 1976) (Brightness Temperatures are in °K)

Gray Scale Number		Swath Number and ESMR Display Parameter									
		1 and 11 (T_H)	2 and 12 (T_V)	3 and 13 $\left(\frac{T_H+T_V}{2}\right)$	4 and 14 (T_H)	5 and 15 (T_V)	6 and 16 $\left(\frac{T_H+T_V}{2}\right)$	7 and 17 (T_H)	8 and 18 (T_V)	9 and 19 $\left(\frac{T_H+T_V}{2}\right)$	10 and 20 (T_V-0.6T_H)
(black)	1	> 200	> 230	> 210	> 250	> 270	> 250	> 290	> 300	> 280	>140
	2	196-200	226-230	206-210	246-250	267-270	247-250	287-290	298-300	278-280	136-140
	3	191-196	223-226	203-206	243-246	264-267	244-247	284-287	295-298	275-278	133-136
	4	187-191	219-223	199-203	239-243	261-264	241-244	281-284	293-295	273-275	129-133
	5	183-187	215-219	195-199	235-239	258-261	238-241	278-281	290-293	270-273	125-129
	6	178-183	211-215	191-195	231-235	254-258	234-238	274-278	288-290	268-270	121-125
	7	174-178	208-211	188-191	228-231	251-254	231-234	271-274	285-288	265-268	118-121
	8	169-174	204-208	184-188	224-228	248-251	228-231	268-271	283-285	263-265	114-118
	9	165-169	200-204	180-184	220-224	245-248	225-228	265-268	280-283	260-263	110-114
	10	161-165	196-200	176-180	216-220	242-245	222-225	262-265	278-280	258-260	106-110
	11	156-161	193-196	173-176	213-216	239-242	219-222	259-262	275-278	255-258	103-106
	12	152-156	189-193	169-173	209-213	236-239	216-219	256-259	273-275	253-255	99-103
	13	148-152	185-189	165-169	205-209	233-236	213-216	253-256	270-273	250-253	95-99
	14	143-148	181-185	161-165	201-205	229-233	209-213	249-253	268-270	248-250	91-95
	15	139-143	178-181	158-161	198-201	226-229	206-209	246-249	265-268	245-248	88-91
	16	134-139	174-178	154-158	194-198	223-226	203-206	243-246	263-265	243-245	84-88
	17	130-134	170-174	150-154	190-194	220-223	200-203	240-243	260-263	240-243	80-84
(white)	18	< 130	< 170	< 150	< 190	< 220	< 200	< 240	< 260	< 240	< 80

T_H = Brightness temperature derived from the ESMR horizontal polarization data

T_V = Brightness temperature derived from the ESMR vertical polarization data

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Table 3-2

Brightness Temperature Value for each Step of the Gray Scale on ESMR Image Displays for Orbits 3933 through 5155 (31 March through 30 June 1976)

(Brightness Temperatures are in °K)

Gray Scale Number	Swath Number and ESMR Display Parameter				
	1 and 6 (T_H)	2 and 7 (T_H)	3 and 8 (T_H)	4 and 9 (T_V)	5 and 10 $\left(\frac{T_H + T_V}{2}\right)$
(black) 1	> 200	> 230	> 210	> 250	> 270
2	196-200	226-230	206-210	246-250	267-270
3	191-196	223-226	203-206	243-246	264-267
4	187-191	219-223	199-203	239-243	261-264
5	183-187	215-219	195-199	235-239	258-261
6	178-183	211-215	191-195	231-235	254-258
7	174-178	208-211	188-191	228-231	252-254
8	169-174	204-208	184-188	224-228	248-252
9	165-169	200-204	180-184	220-224	245-248
10	161-165	196-200	176-180	216-220	242-245
11	156-161	193-196	173-176	213-216	239-242
12	152-156	189-193	169-173	209-213	236-239
13	148-152	185-189	165-169	205-209	233-236
14	143-148	181-185	161-165	201-205	229-233
15	139-143	178-181	158-161	198-201	226-229
16	134-139	174-178	154-158	194-198	223-226
17	130-134	170-174	150-154	190-194	220-223
(white) 18	< 130	<170	<150	<190	< 220

T_H = Brightness temperature derived from the ESMR horizontal polarization data

T_V = Brightness temperature derived from the ESMR vertical polarization data

Table 3-3

Brightness Temperature Value for each Step of the Gray Scale on ESMR Image Displays for orbit 6185 through 7619 (15 September through 31 December 1976)
(Brightness Temperatures are in °K)

Gray Scale Number	Swath Number and ESMR Display Parameter				
	1 and 6	2 and 7	3 and 8	4 and 9	5 and 10
	(T_V)	(T_V)	(T_V)	(T_V)	(T_V)
(black) 1	>240	>254	>270	>280	>300
2	236-240	251-254	266-270	277-280	296-300
3	233-236	248-251	263-266	274-277	293-296
4	230-233	245-248	260-263	271-274	290-293
5	227-230	242-245	257-260	268-271	287-290
6	224-227	239-242	254-257	265-268	284-287
7	221-224	236-239	251-254	262-265	281-284
8	218-221	233-236	248-251	259-262	278-281
9	215-218	230-233	245-248	256-259	275-278
10	212-215	227-230	242-245	253-256	272-275
11	209-212	224-227	239-242	250-253	269-272
12	206-209	221-224	236-239	247-250	266-269
13	203-206	218-221	233-236	244-247	263-266
14	200-203	215-218	230-233	241-244	260-263
15	197-200	212-215	227-230	239-241	257-260
16	193-197	208-212	223-227	237-239	253-257
17	190-193	205-208	220-223	235-237	250-253
(white) 18	<190	<205	<220	<235	<250

T_V = Brightness temperature derived from the ESMR vertical polarization data

- 3200

 This identifies the computer used to process the data. All data was processed by the Control Data Corporation (CDC) 3200.

ESMR CHANNEL-RANGE DISPLAYS

Through orbit 3932 (31 March), the ESMR displays contained 20 swaths of data, as shown in the ESMR image displays in Section 3.3, The Nimbus 6 Data Catalog, Volume 1-5. The swaths are numbered (numbers not shown) from 1 on the left to 20 on the right. Each of the ten swaths on the left has the same geographic coverage. However, each swath displays either horizontally or vertically polarized data at a temperature range as listed in Table 3-1. The right set of ten swaths has a similar format, and displays the earliest recorded data. If the right swaths were cut and placed above the group on the left, the new display would show the continuous coverage recorded for that orbit. Swaths 1 and 11 have the same polarization and temperature range. Similarly, swaths 2 and 12, 3 and 13, etc., are the same. Table 3-1 is set up to show this duplication of parameter information.

The ESMR image display format has been modified on two occasions since launch date. The first modification occurred after orbit 3933 (31 March 1976) and the second change occurred after orbit 6184 (15 September 1976).

From orbit 3933 through orbit 6184 the ESMR image display had the following format:

The displays contain swaths of data plus a geographic grid overlay for each swath, as shown in the ESMR image display after orbit 3933 in Section 3.3, The Nimbus 6 Data Catalog, Volume 5 through 7. The swaths are numbered (numbers not displayed) from 1 on the left to 10 on the right. Each of the five swaths on the left has the same geographic coverage. However, each swath displays either horizontally or vertically polarized data at a temperature range as listed in Table 3-2.

The right set of five swaths has a similar format, and displays the latest recorded data. If the right swaths were cut and placed below the group on the left, the new display would show the continuous coverage of that display.

Swaths 1 and 6 display the same parameter. That is, the temperature range and polarization for swaths 1 and 6 are the same. Similarly, swaths 2 and 7, 3 and 8, 4 and 9, 5 and 10 display the same parameters. Table 3-2 is set up to show this duplication of parameter information.

Data time (GMT) references for the left set of five swaths are shown adjacent to the vertical line at the left. Time tick marks are every five minutes with hour and minute annotation every fifteen minutes. Data time references for the right set of five swaths are shown in a similar manner adjacent to the vertical line at the right.

The center portion of the display contains two swaths of grid overlay information: the left grid for overlay on each of the five swaths on the left, and the right grid for overlay on each of the five swaths on the right. The grid longitudes are generated at ten degree intervals between 55 degrees south and 55 degrees north, and at 20 degree intervals from 55 degrees to the Poles. Latitude grids are generated every five degrees. All grid lines consist of a series of dots at one degree intervals. Latitudes are labeled 60°S, 30°S, EQ, 30°N, and 60°N. Longitude labels are normally placed next to each latitude label.

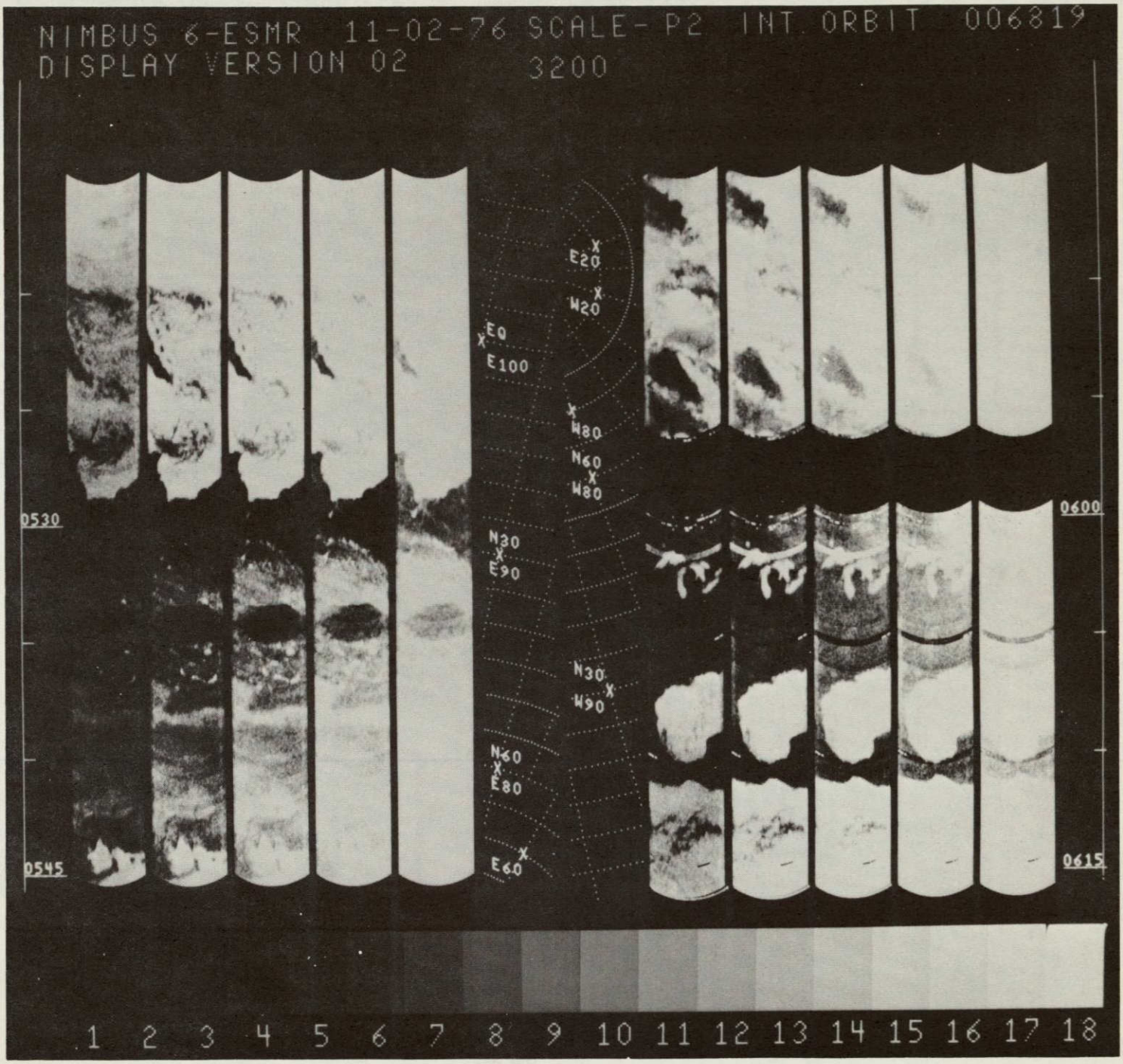
From orbit 6185 (15 September 1976) through the current data catalog period, the new ESMR image display has the following format:

Since an anomaly renders the Horizontal channel unuseable, the new ESMR format was devised to display the Vertical channel with five different temperature ranges and polarization for each individual swath. That is, the temperature range and polarization for swaths 1 and 6 are the same. Swaths 2 and 7, 3 and 8, 4 and 9, 5 and 10 display the same parameters. Thus, four additional swaths of data are dedicated to the Vertical channel display for a total of 5 swaths as described above.

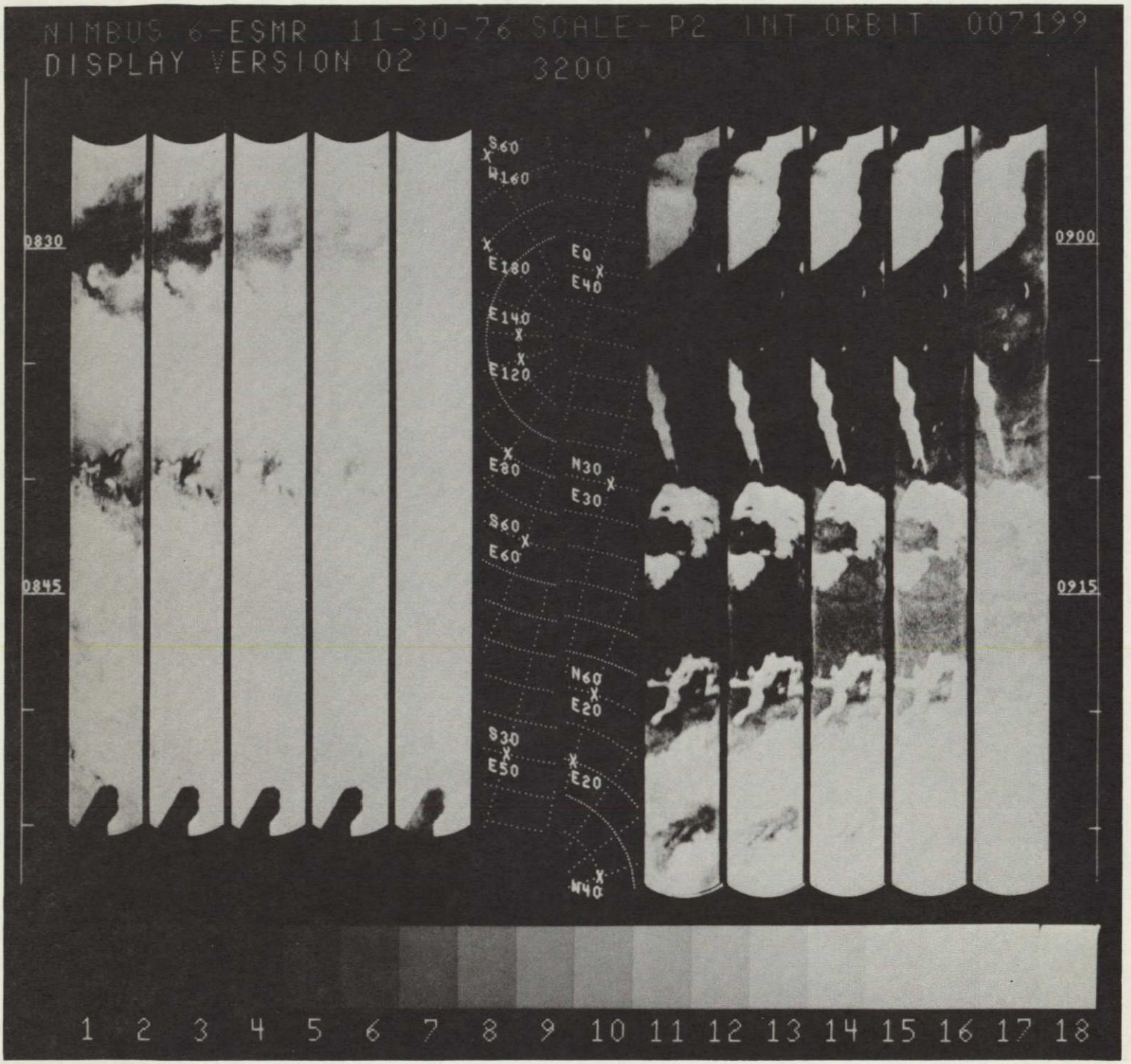
Data time (GMT) references and grid overlay information remain unchanged. Please refer to Table 3-3 for new parameter information.

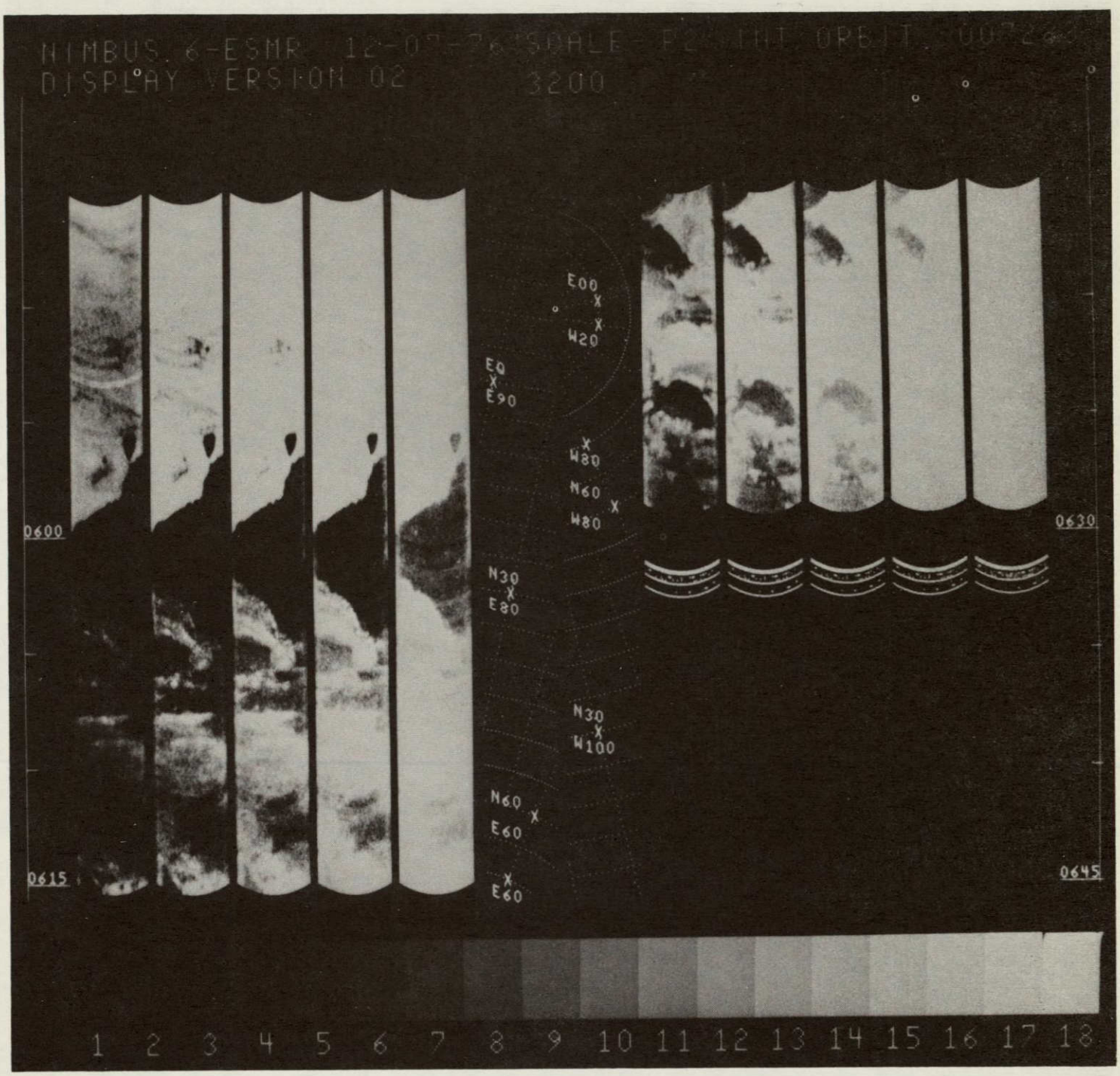
SECTION 3.1

SELECTED ESMR IMAGE DISPLAYS

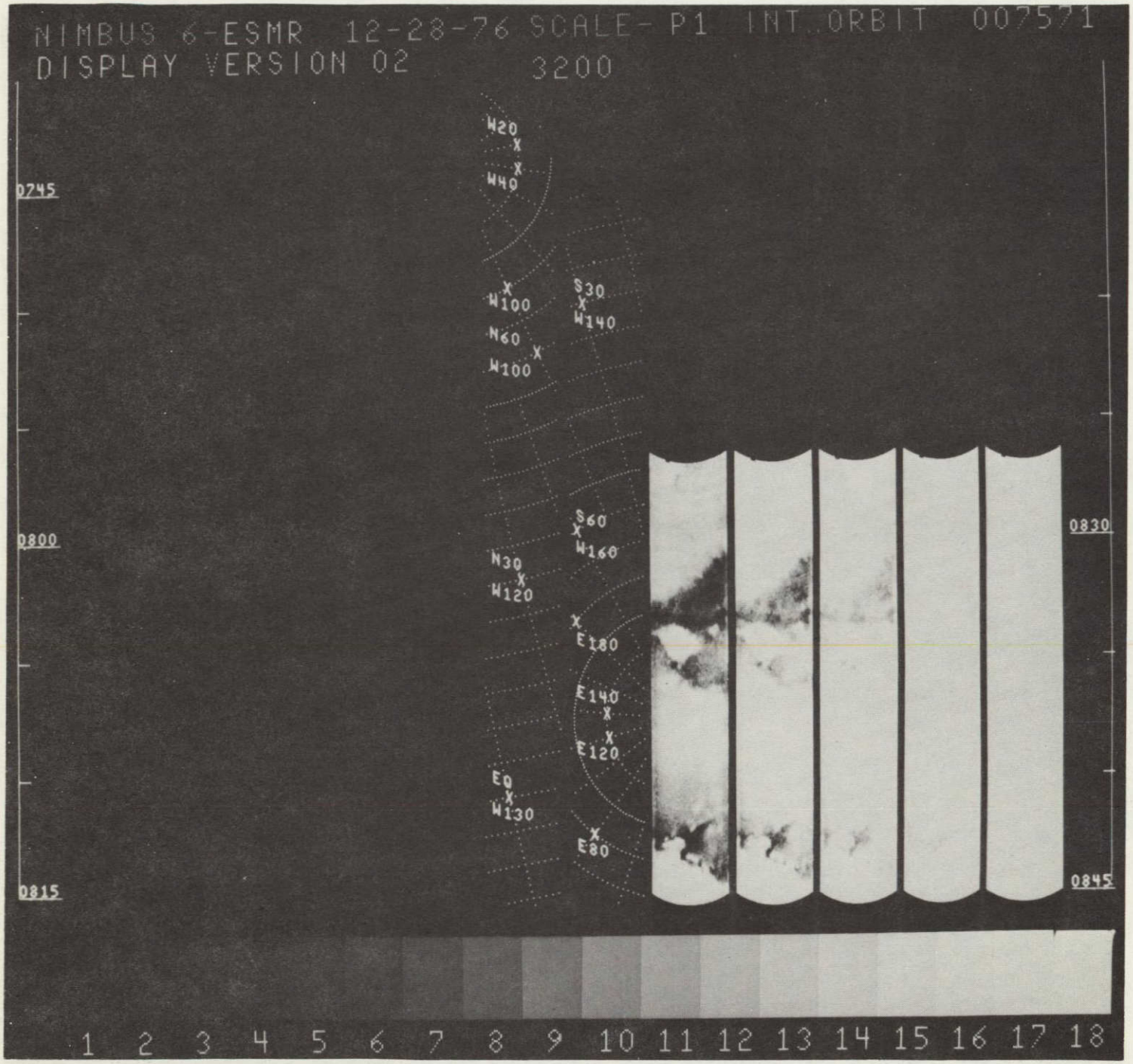


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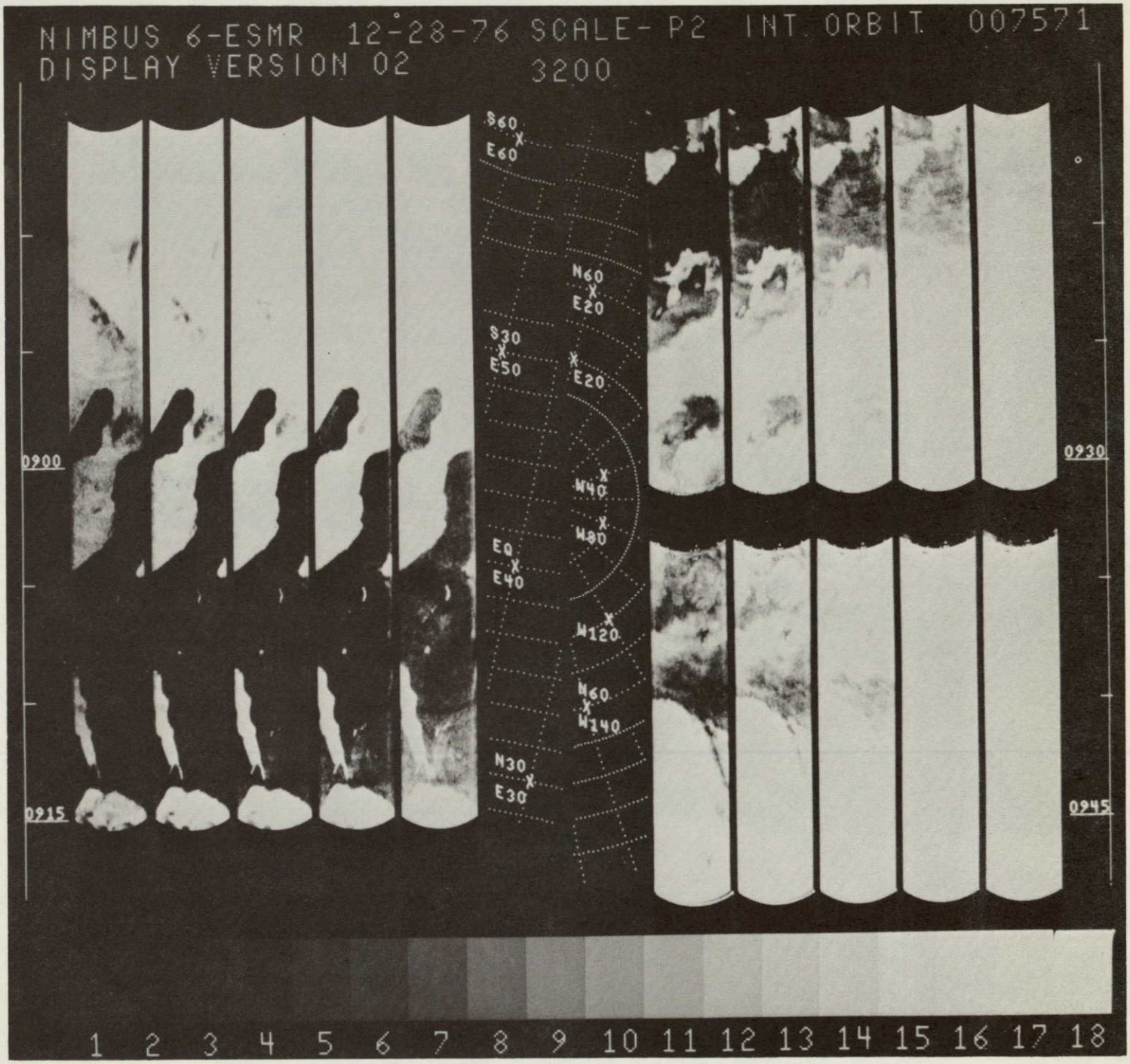

NIMBUS 6-ESMR 11-30-76 SCALE- P2 INT ORBIT 007199
DISPLAY VERSION 02
3200
0830
0845
0900
0915
S60
W160
E180
E0
E40
E140
E120
E80
N30
E30
S60
E60
N60
E20
S30
E50
E20
W40
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18



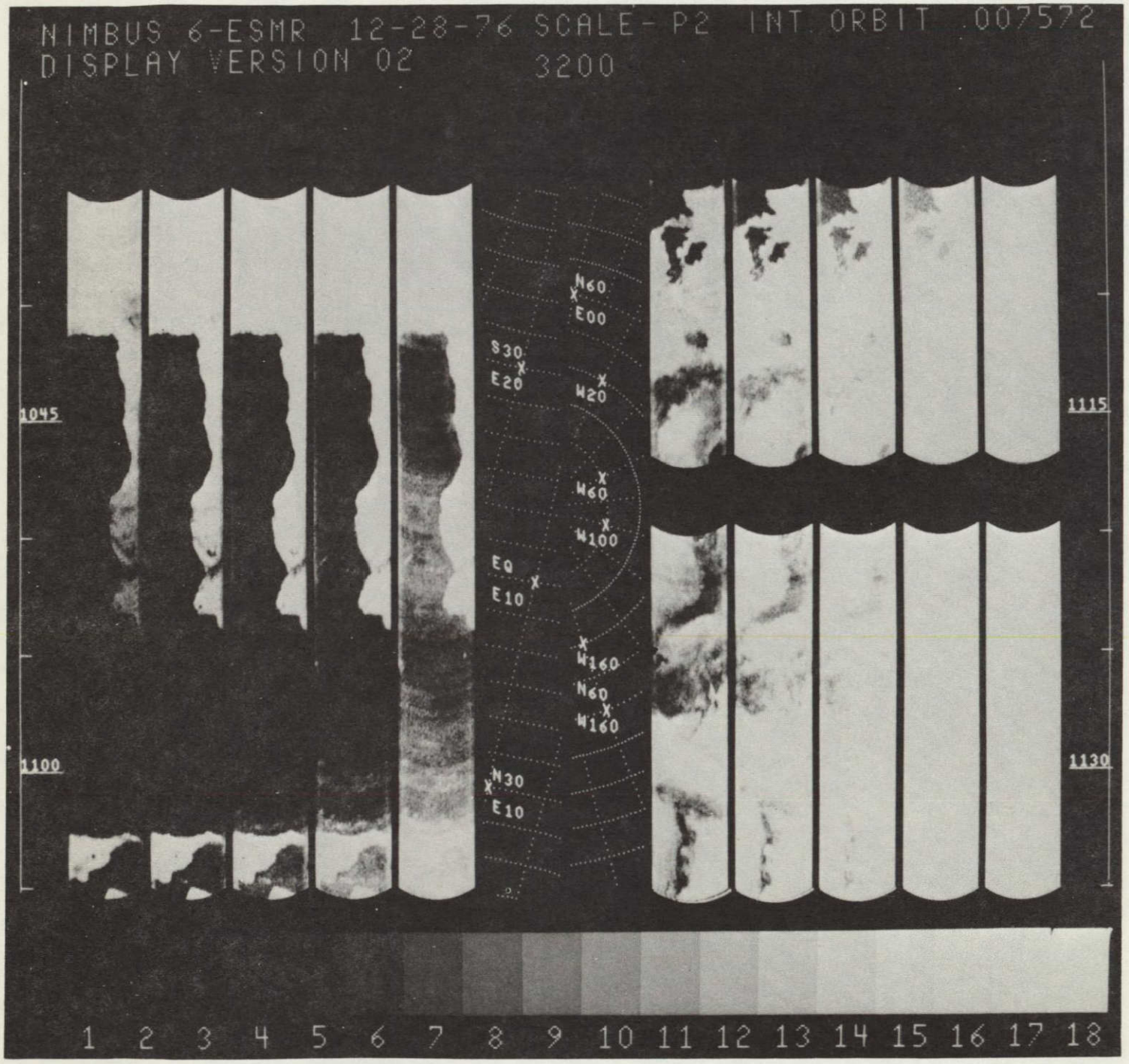
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SECTION 4

TEMPERATURE HUMIDITY INFRARED RADIOMETER MONTAGES

The Nimbus 6 Temperature Humidity Infrared Radiometer (THIR) subsystem is of the same design and operation as the THIR flown on Nimbus 4 and 5. The two-channel scanning radiometer measures earth radiation in two spectral bands. A 10.3 μm to 12.5 μm window channel provides an image of the cloud cover, and temperatures of the cloud tops, land, and ocean surfaces. A 6.5 μm to 7.1 μm (6.7 μm) channel provides information on the moisture content of the upper troposphere and stratosphere, and the location of jet streams and frontal systems. Ground resolution at the satellite subpoint is 8.2 km for the 11.5 μm channel and 22.5 km for the 6.7 μm channel. Both channels operate continuously to provide day and night global coverage. However, with only HDRSS recorder (B) available for part-time use on the satellite, gaps in global coverage occur over "blind" orbit areas, and sometimes over the Rosman and Alaska STDN stations, when the tape data are being transmitted to the ground. The blind orbits occur during a daytime pass over the western part of the Pacific Ocean and during a nighttime pass over the eastern part of the Atlantic Ocean. (Additionally, with the limited part-time (65 minutes) coverage by the HDRSS (B), nighttime passes north of the Equator are of limited duration.) These blind orbit areas happen when the Orroral, Australia is not available for playback of recorded data. Then the time between successive playbacks of the tape recorder becomes longer than the reduced record capability of HDRSS (B).

This section pictorially documents the data from the THIR. Section 4.1 contains all nighttime THIR 11.5 μm and 6.7 μm montages and Section 4.2 contains all daytime THIR 11.5 μm and 6.7 μm montages, arranged in chronological order. Key latitudes can be read from the superimposed grids. Grid points are identified where each swath crosses 60°N, 30°N, EQUATOR, 30°S and 60°S.

Vellum Location Guide overlays, attached to the back of this document, are to be used for general orientation with the data presented in each THIR montage. Proper alignment of the overlay grid is accomplished by matching the grid indices on the equator with the two "T" marks on each montage.

THIR photographic data and/or digital data can be ordered through the National Space Science Data Center (NSSDC), Code 601, Goddard Space Flight Center, Greenbelt, Maryland 20771.

THIR photographic data consist of 70 mm film strips produced from the radiometer output signals. The gray shades in each image correspond to temperature variations of the land, sea, and clouds. On a film positive the lightest tones represent cold temperatures, while the darkest tones represent warm temperatures. THIR photographic data are archived in separate 6.7 μm and 11.5 μm daytime and nighttime swaths. The approximate coverage of a full swath is from pole to pole.

When ordering THIR photographic data from NSSDC the following information should be given:

- Satellite (e. g. Nimbus 6)
- Date of data
- Data orbit number, channel (11. 5 μm or 6. 7 μm), and whether day or night data
- Data format, i. e., positive or negative transparencies, or prints
- Area of interest defined by latitude and longitude

In addition to the THIR film strips, photographic copies of the daily day or night montages prepared from film strips can be obtained.

Quantitative digital data are obtained when the original analog signals are digitized with full fidelity, and processed by an IBM 360 computer, where calibration and geographic referencing are applied. Each reduced radiation data tape prepared by the IBM 360 is called a Nimbus Meteorological Radiation Tape-THIR (NMRT-THIR). The NMRT can be used to generate grid print maps or to accomplish special scientific analyses. The format of this tape may be found in The Nimbus 6 User's Guide, Section 2.

Due to the large volume and the long computer running time required for processing THIR into NMRTs, Nimbus 6 THIR digital data are not routinely reduced to final NMRT format. Only those data which are specifically requested by the user will be processed. Requests should be made through NSSDC. The user is urged to make full use of the film strips which are abundantly available in nearly real time from the NSSDC.

A series of programs at GSFC produce printed and contoured data referenced to a grid on Polar Stereographic or Mercator map bases. These are called grid print maps. The advantages of the grid print map presentation are the display of absolute values of temperatures in their approximate location and geographical rectification of the data. Grid print maps may be produced for either a single orbit or a composite of several orbits. The following standard options are available and should be specified when requesting grid print maps from NSSDC.

- Map and Approximate Scale
 a. Polar Stereographic, 1:30 million
 b. Polar Stereographic, 1:10 million

c. Multi-resolution Mercator maps are available down to 1:1 million scale.

- Maximum Scan Angle (50 degrees is practical limit)

- Field Values and Contouring. Unless otherwise specified, all maps will include field values and contouring except Mercator maps of scales larger than 1:20 million. A data population map, indicating the number of individual measurements contained in each grid point average, as well as a latitude-longitude description for geographically locating the data, will be provided along with each grid print map.

When ordering grid print map data, the following identifying information should be given:

- Satellite (e.g., Nimbus 6)
- Sensor (THIR)
- Channel (6.7 μm or 11.7 μm)
- Data Orbit Number
- Calendar Date of Equator Crossing
- Beginning and Ending Times of Data in GMT
- Latitude and Longitude Limits of Area of Interest
- Map Type and Map Scale
- Scan Angle Limits
- Contouring or No Contouring of Data Points

When ordering NMRTs, the "Calendar Date of Equator Crossing" and "Map Type and Map Scale" can be omitted.

Beginning and ending times of data in GMT can be interpolated using Table 4-1 which gives the elapsed time from either ascending or descending node as a function of latitude. These elapsed time values can be appropriately added or subtracted from node times given in Table 2-2.

A complete description of the THIR experiment may be found in The Nimbus 6 User's Guide, Section 2.

Table 4-1

Latitude Versus Minutes From
Ascending or Descending Node

Latitude from AN or DN	Minutes and Seconds from AN or DN
0	0:00
5	1:31
10	3:02
15	4:33
20	6:03
25	7:34
30	9:05
35	10:36
40	12:08
45	13:40
50	15:12
55	16:44
60	18:18
65	19:52
70	21:33
75	23:26
78	24:44
80.1	26:49
78	29:00
75	30:09
70	31:51
65	33:35

SECTION 4.1

TEMPERATURE HUMIDITY INFRARED RADIOMETER

NIGHTTIME MONTAGES

6815 6814 6813 6812 6811 6810 6809 6808 6807 6806 6805 6804 6803

1 NOV 76

6.7μm

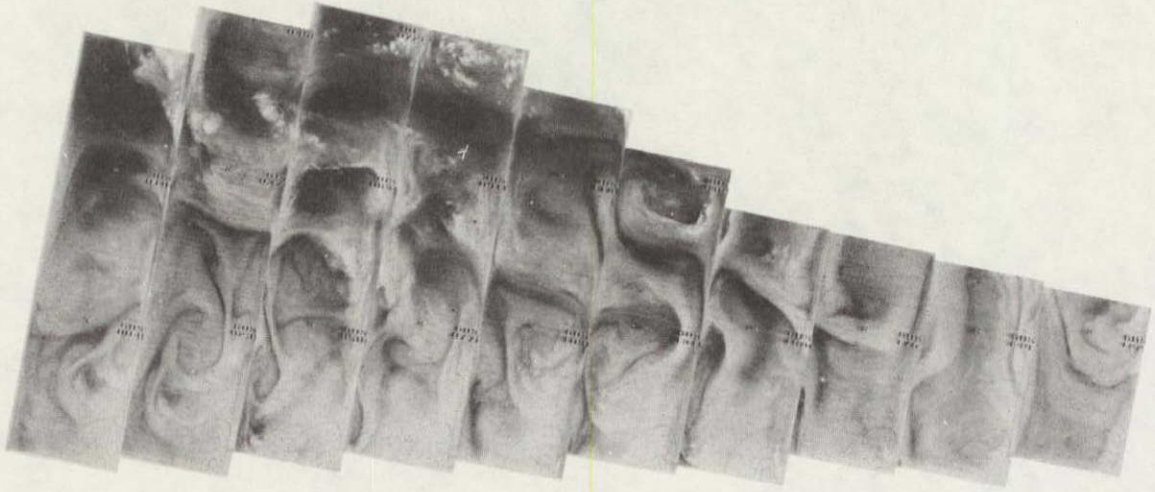
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6815 6814 6813 6812 6811 6810 6809 6808 6807 6806 6805 6804 6803

1 NOV 76

11.5μm

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6829 6828 6827 6826 6825 6824 6823 6822 6821 6820 6819 6818 6817 6816

2 NOV 76

6.7μm

6829 6828 6827 6826 6825 6824 6823 6822 6821 6820 6819 6818 6817 6816

2 NOV 76

11.5μm

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6842 6841 6840 6839 6838 6837 6836 6835 6834 6833 6832 6831 6830

3 NOV 76

6.7μm

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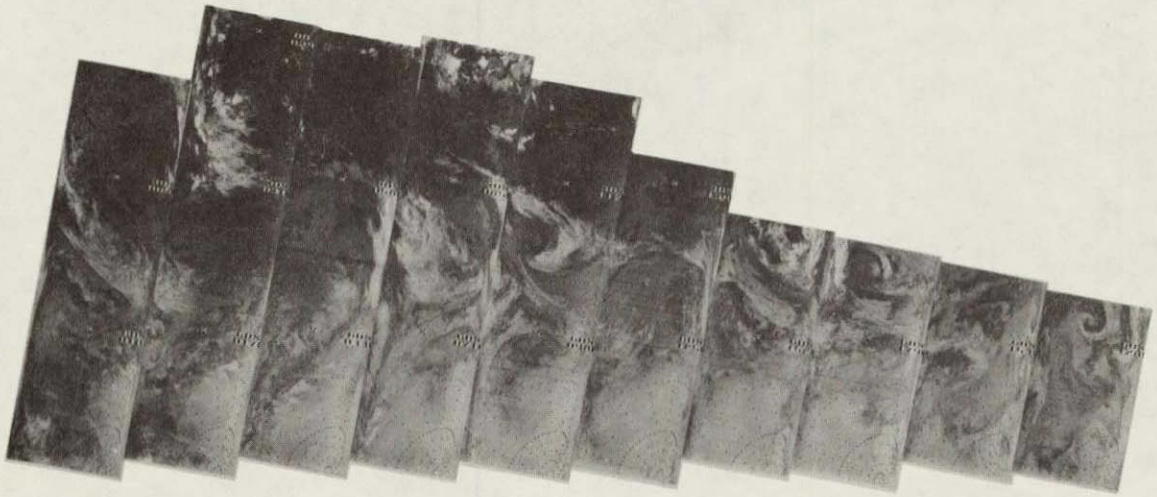




6856 6855 6854 6853 6852 6851 6850 6849 6848 6847 6846 6845 6844 6843

4 NOV 76

6.7μm



6856 6855 6854 6853 6852 6851 6850 6849 6848 6847 6846 6845 6844 6843

4 NOV 76

11.5μm



6869 6868 6867 6866 6865 6864 6863 6862 6861 6860 6859 6858 6857

5 NOV 76

6.7μm

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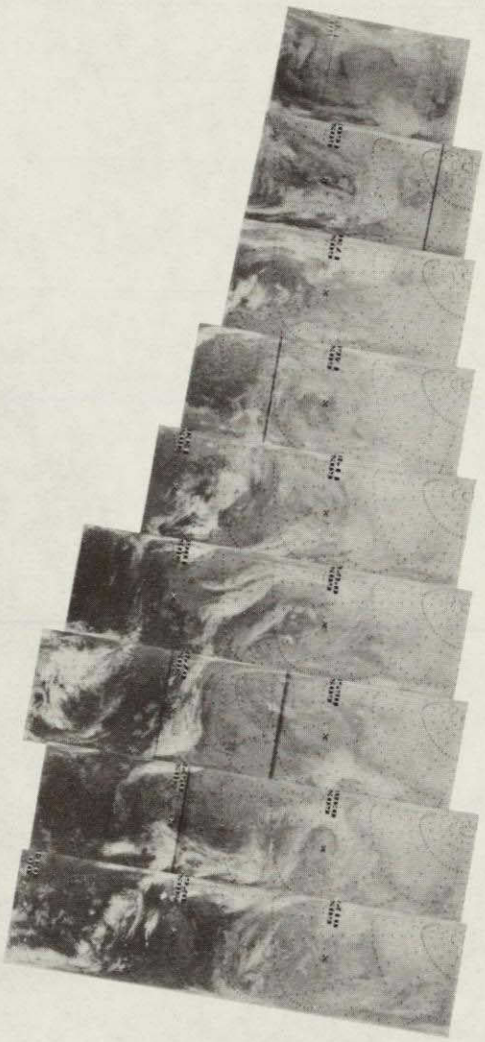


6882 6881 6880 6879 6878 6877 6876 6875 6874 6873 6872 6871 6870

6 NOV 76

6.7μm

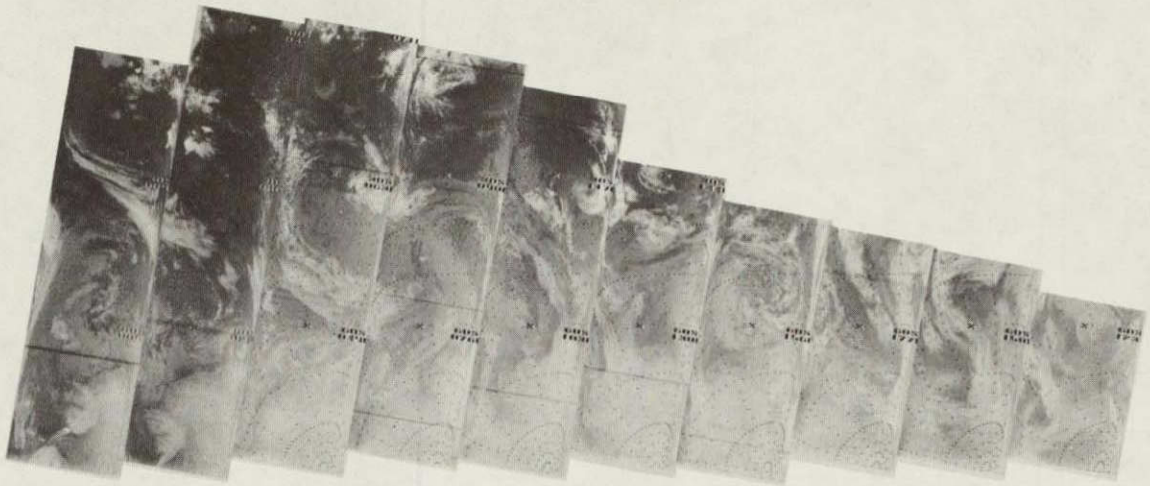
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6896 6895 6894 6893 6892 6891 6890 6889 6888 6887 6886 6885 6884 6883

7 NOV 76

6.7μm



6896 6895 6894 6893 6892 6891 6890 6889 6888 6887 6886 6885 6884 6883

7 NOV 76

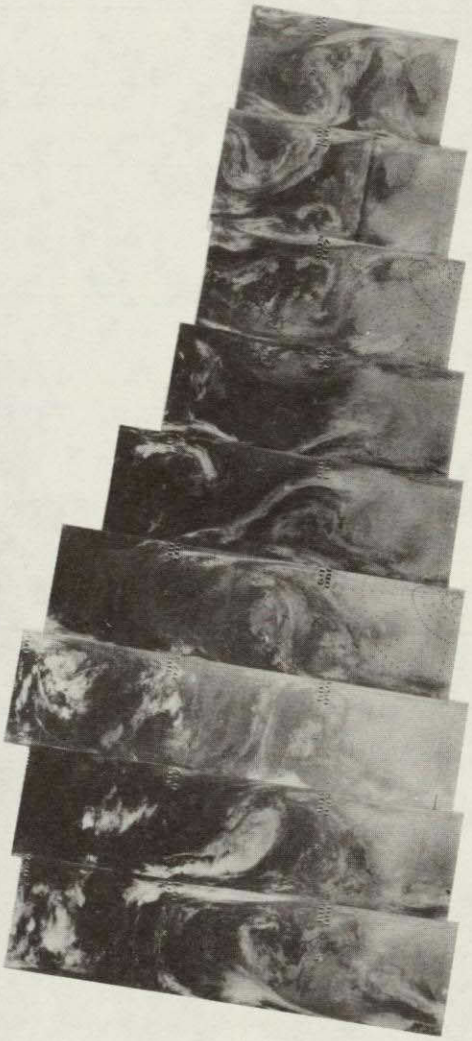
11.5μm

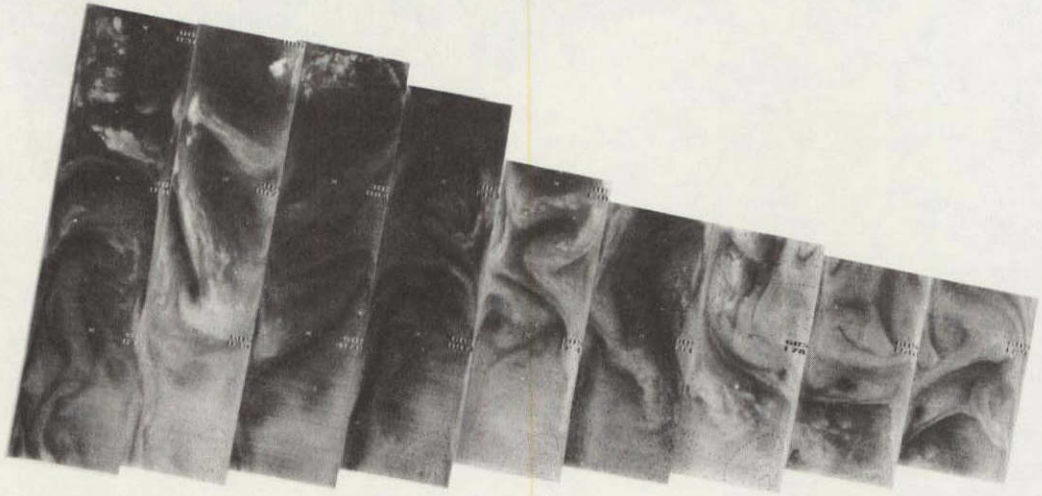
6909 6908 6907 6906 6905 6904 6903 6902 6901 6900 6899 6898 6897

8 NOV 76

6.7μm

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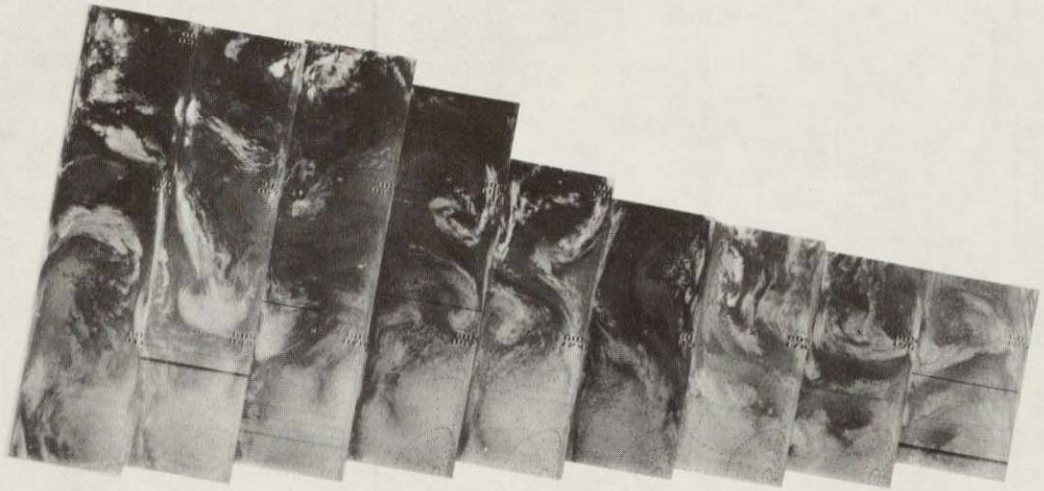




6923 6922 6921 6920 6919 6918 6917 6916 6915 6914 6913 6912 6911 6910

9 NOV 76

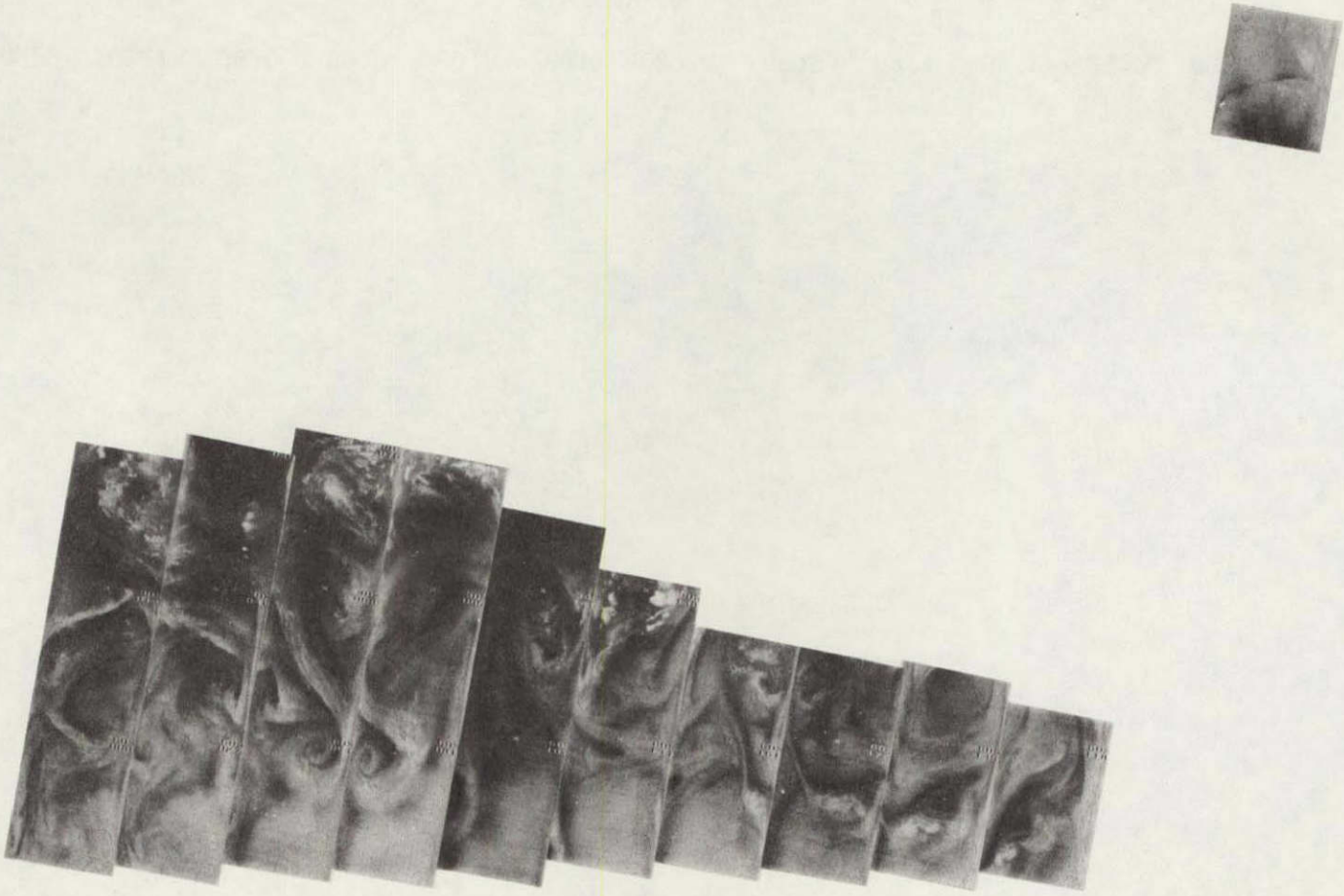
6.7μm



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9 NOV 76

11.5μm



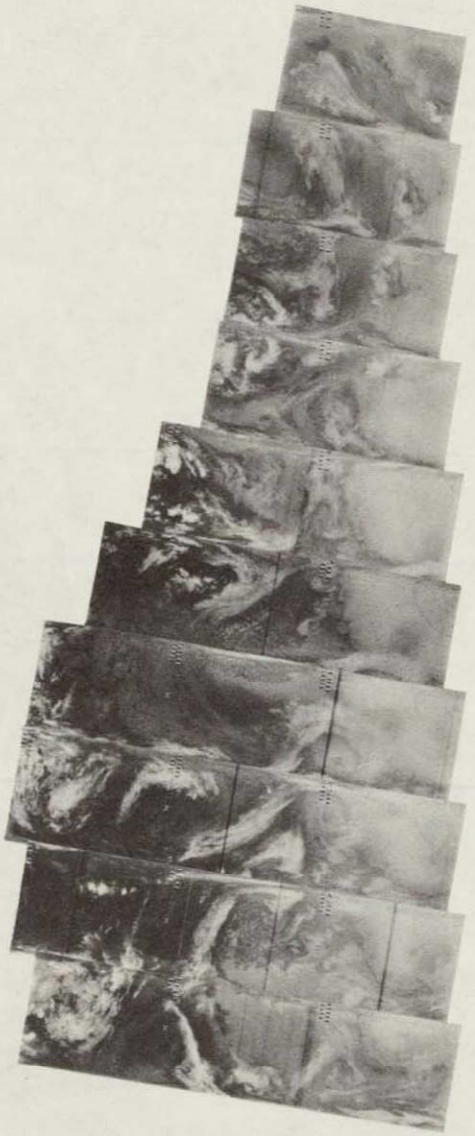
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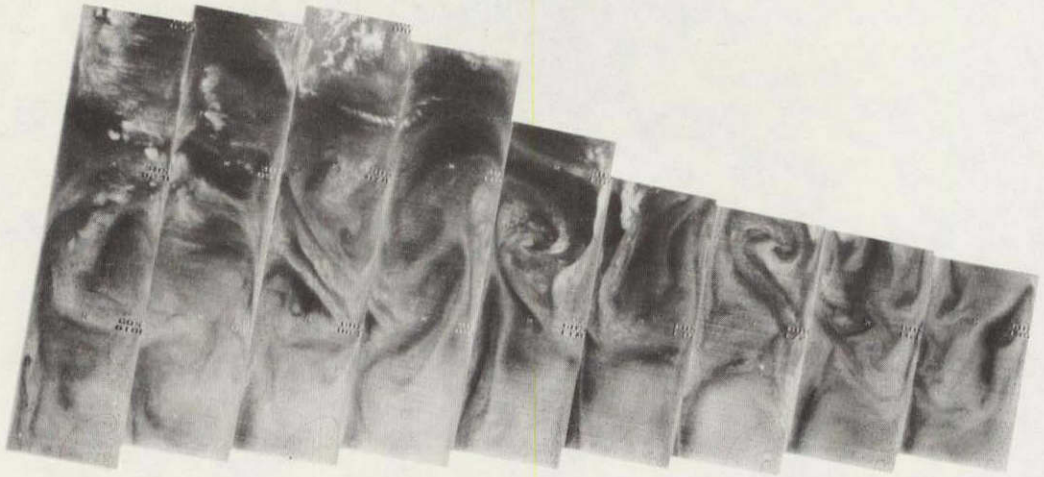
10 NOV 76

6.7μm



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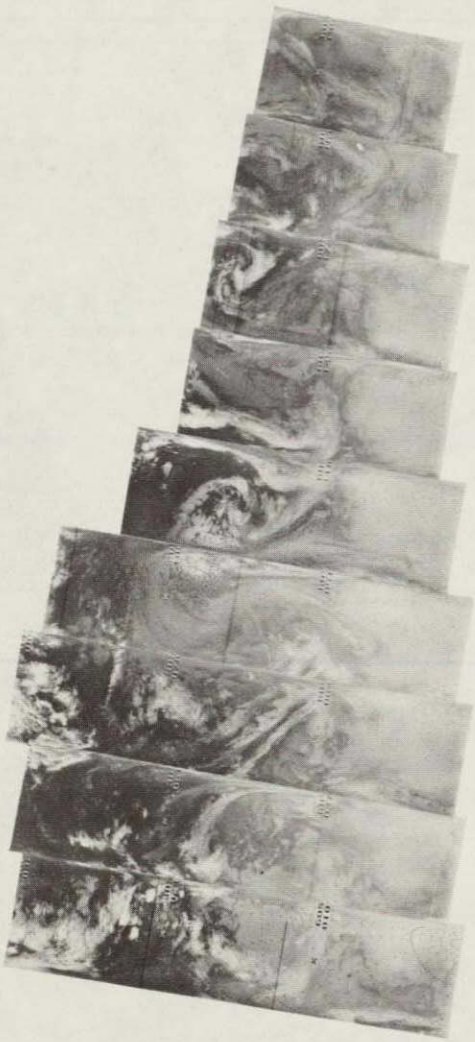


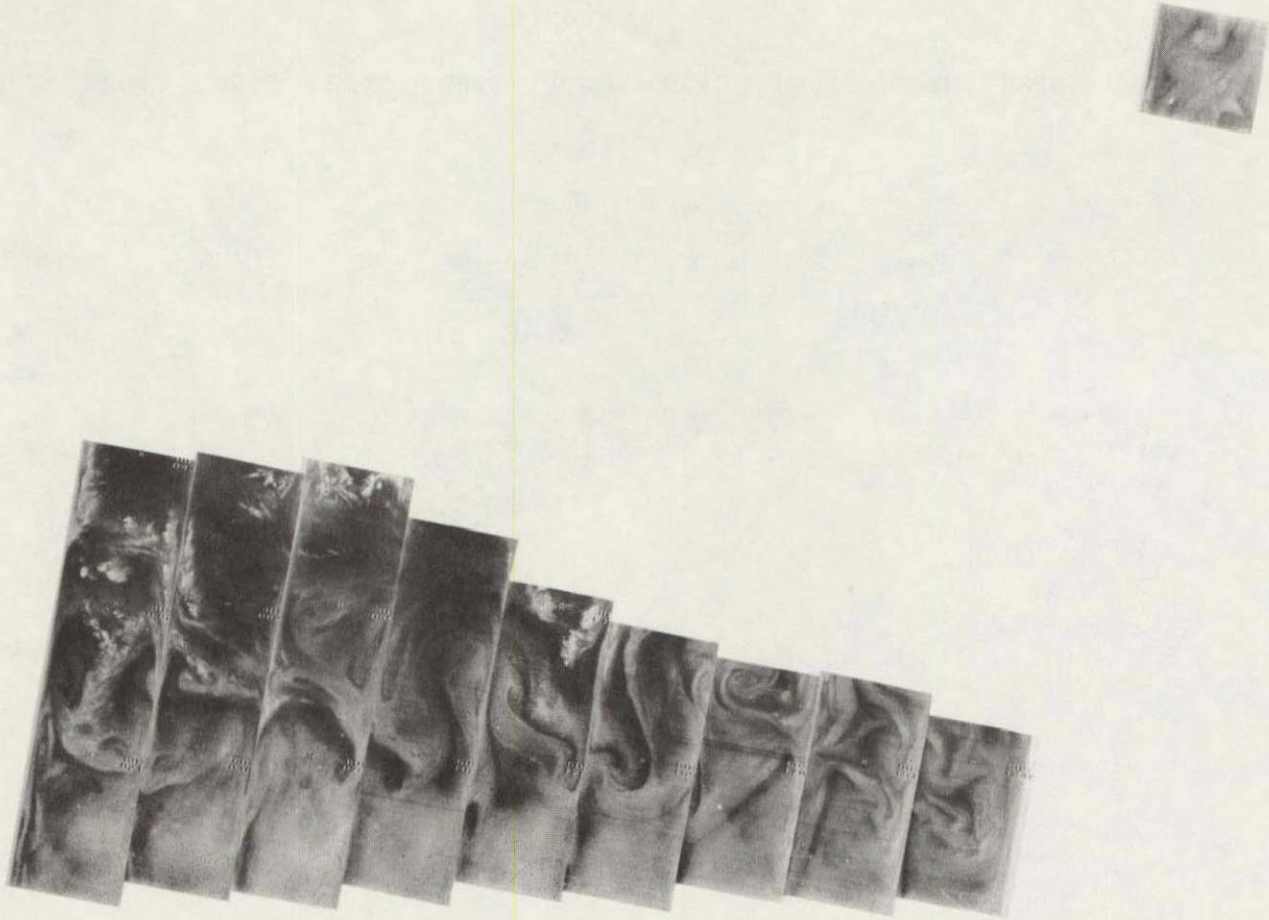
6949 6948 6947 6946 6945 6944 6943 6942 6941 6940 6939 6938 6937

11 NOV 76

6.7μm

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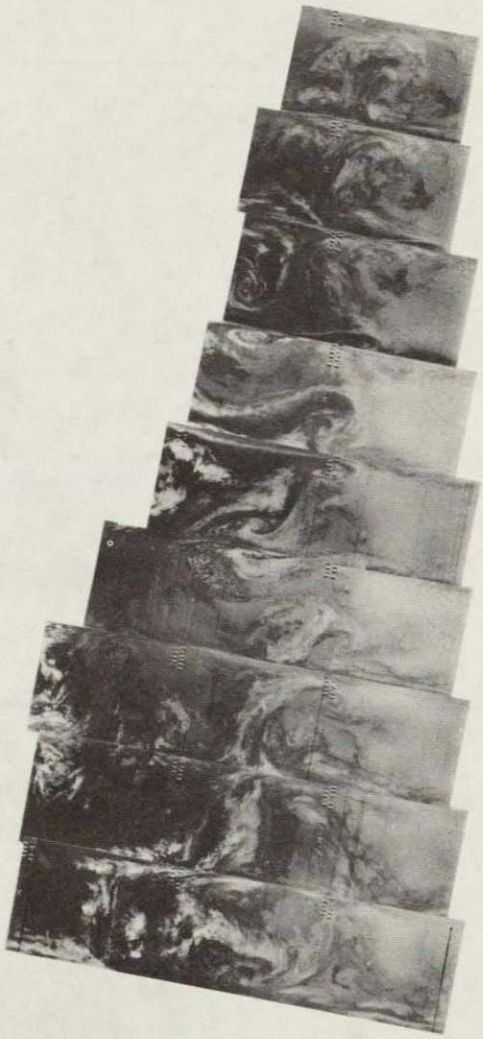
6963 6962 6961 6960 6959 6958 6957 6956 6955 6954 6953 6952 6951 6950

12 NOV 76

6.7μm



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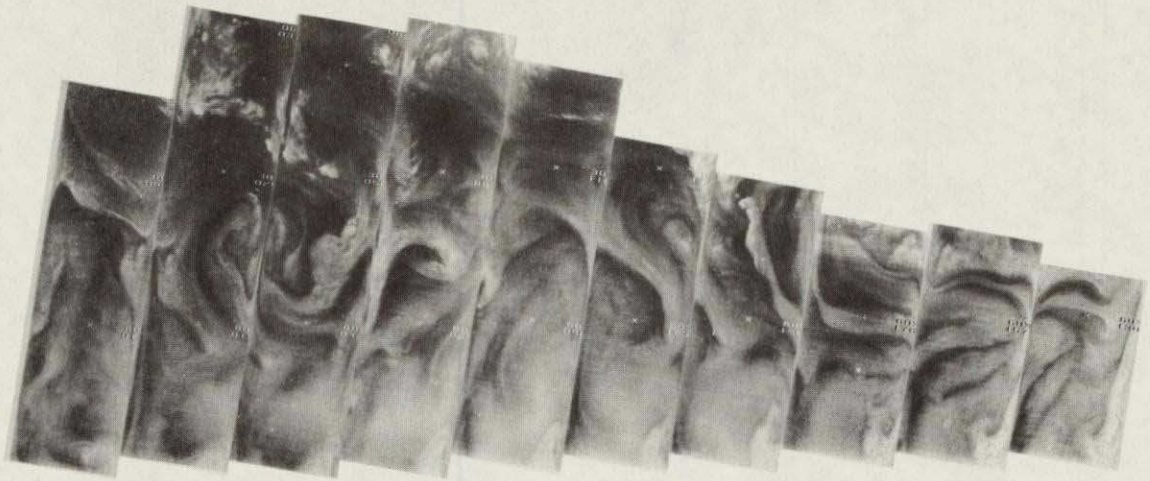




6976 6975 6974 6973 6972 6971 6970 6969 6968 6967 6966 6965 6964

13 NOV 76

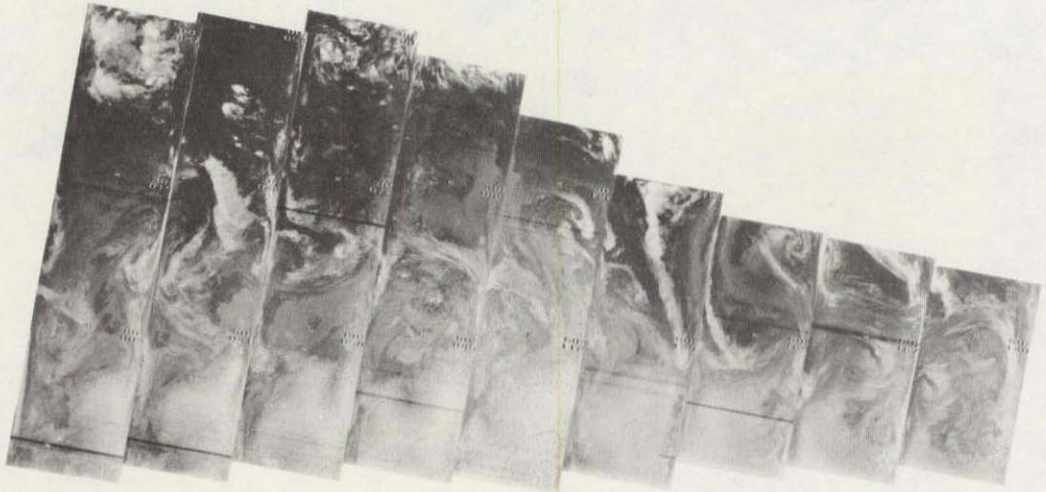
6.7μm



6990 6989 6988 6987 6986 6985 6984 6983 6982 6981 6980 6979 6978 6977

14 NOV 76

6.7μm



6976 6975 6974 6973 6972 6971 6970 6969 6968 6967 6966 6965 6964

13 NOV 76

11.5μm

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6977 6978 6979 6980 6981 6982 6983 6984 6985 6986 6987 6988 6989 6990

14 NOV 76

11.5μm



7003 7002 7001 7000 6999 6998 6997 6996 6995 6994 6993 6992 6991

15 NOV 76

6.7μm

7003 7002 7001 7000 6999 6998 6997 6996 6995 6994 6993 6992 6991

15 NOV 76

11.5μm

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7016 7015 7014 7013 7012 7011 7010 7009 7008 7007 7006 7005 7004

16 NOV 76

6.7μm

7016 7015 7014 7013 7012 7011 7010 7009 7008 7007 7006 7005 7004

16 NOV 76

11.5μm



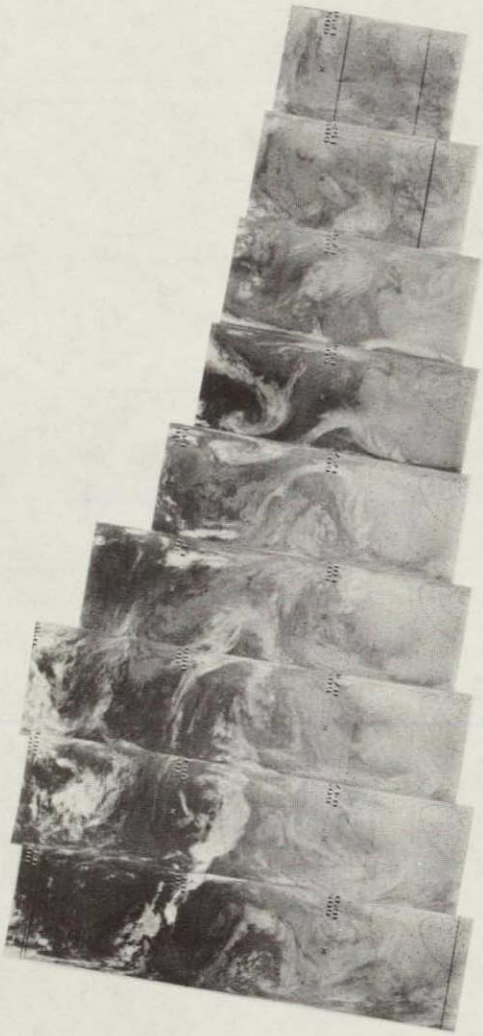
7030 7029 7028 7027 7026 7025 7024 7023 7022 7021 7020 7019 7018 7017

17 NOV 76

6.7μm



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7043 7042 7041 7040 7039 7038 7037 7036 7035 7034 7033 7032 7031

18 NOV 76

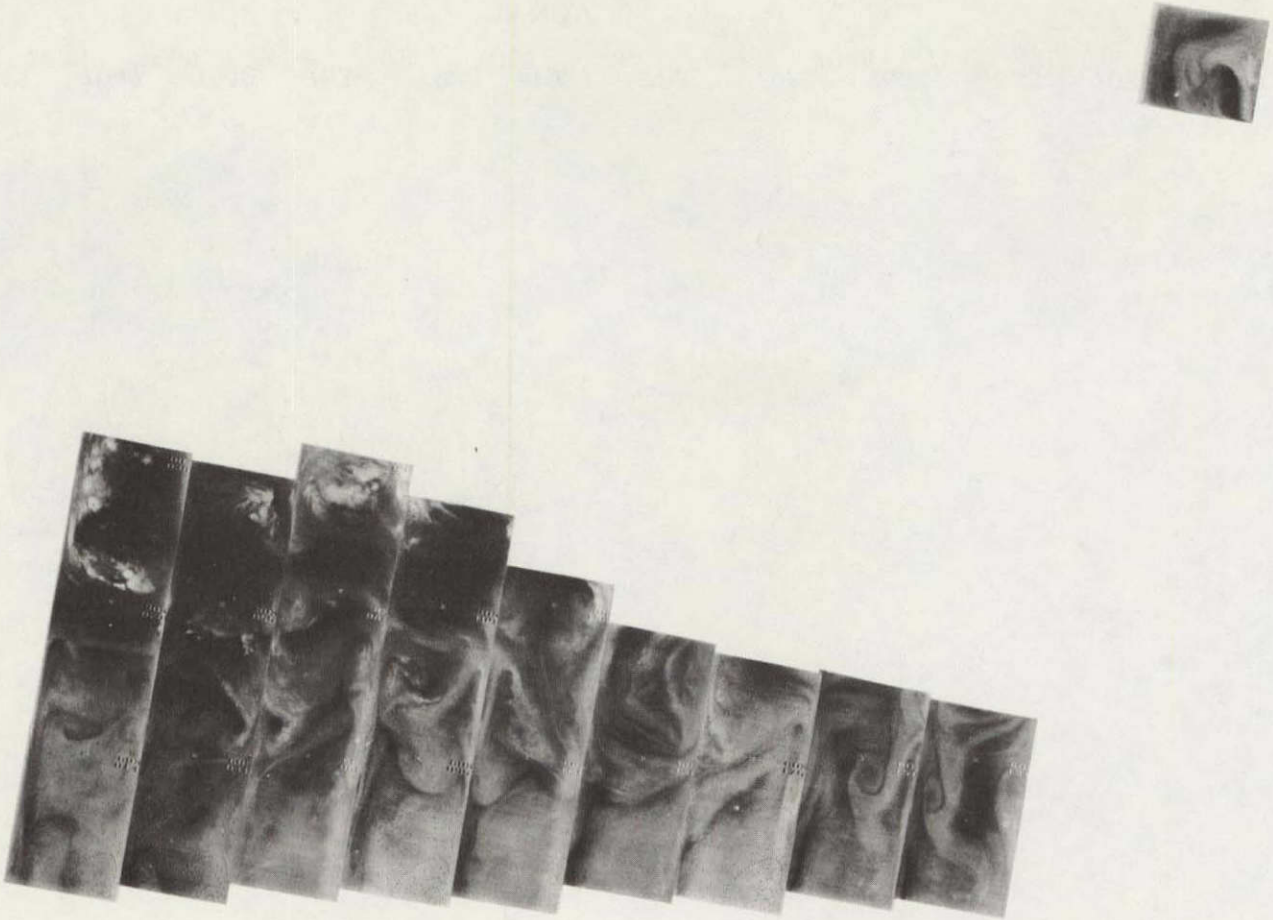
6.7μm



7043 7042 7041 7040 7039 7038 7037 7036 7035 7034 7033 7032 7031

18 NOV 76

11.5μm



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19 NOV 76

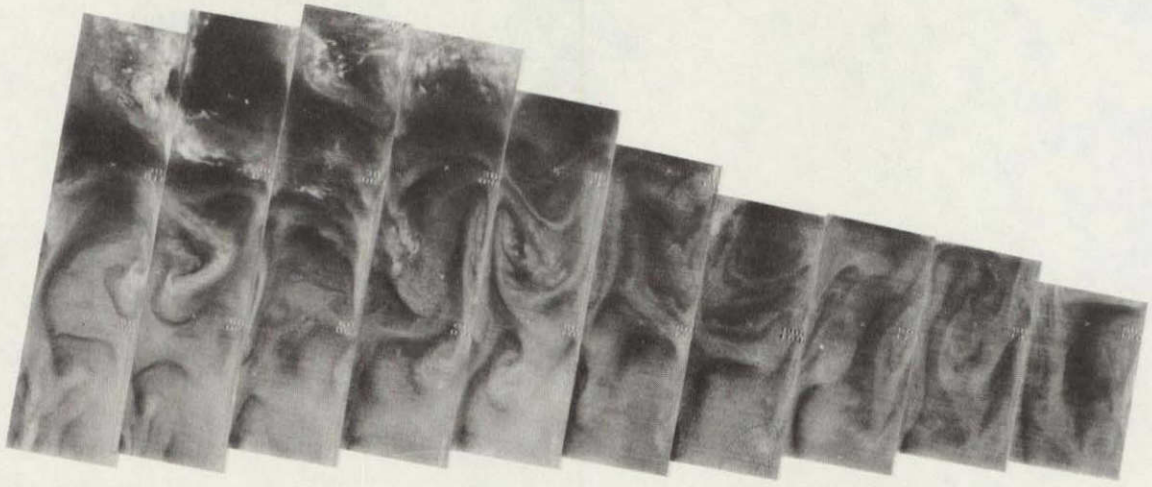
6.7μm



7057 7056 7055 7054 7053 7052 7051 7050 7049 7048 7047 7046 7045 7044

19 NOV 76

11.5μm

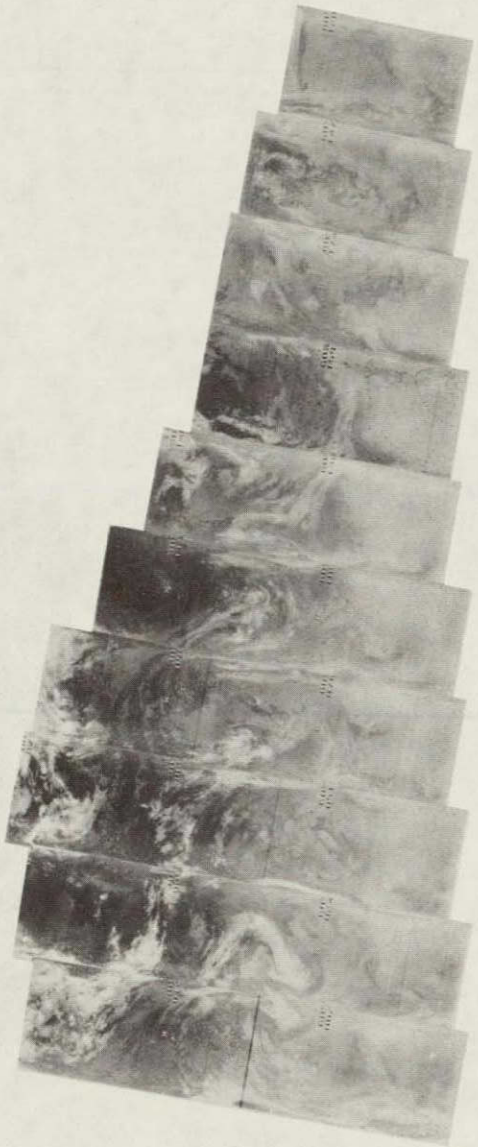


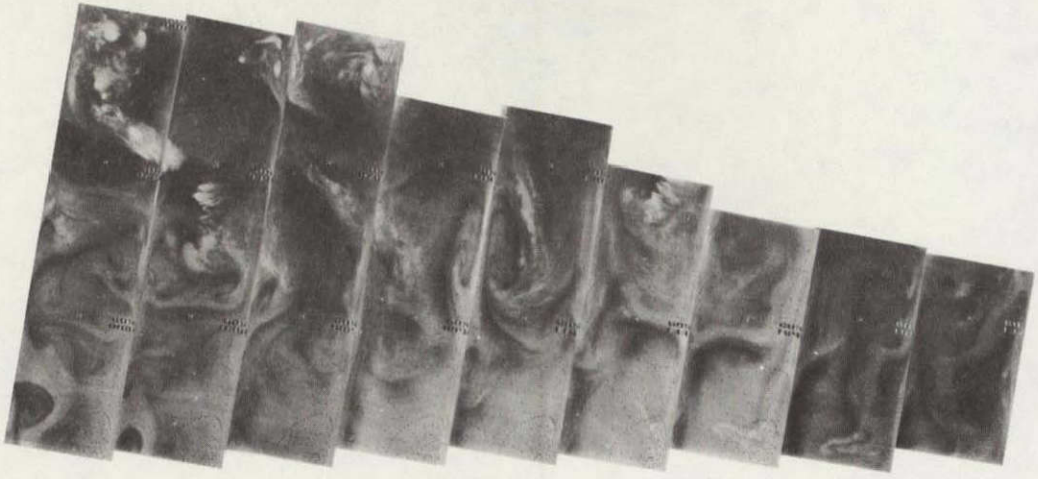
7070 7069 7068 7067 7066 7065 7064 7063 7062 7061 7060 7059 7058

20 NOV 76

6.7μm

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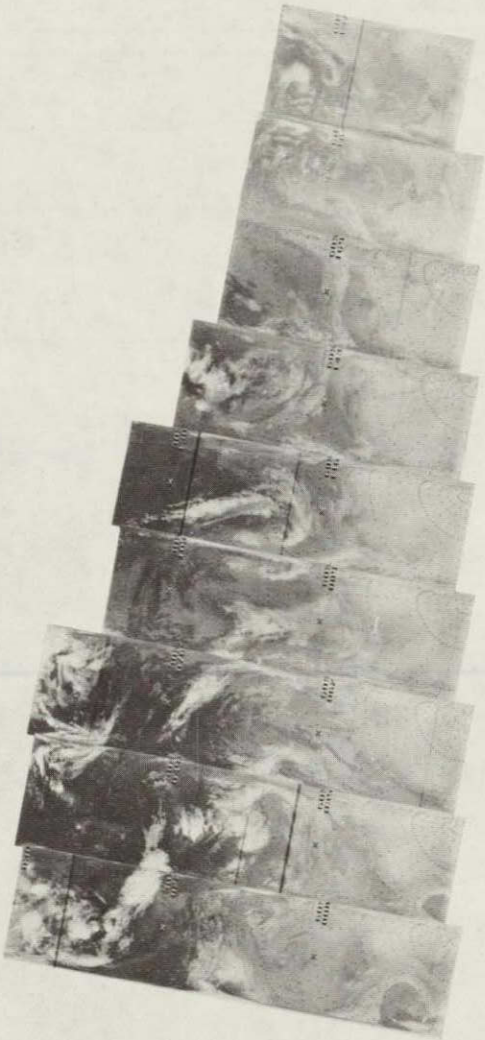


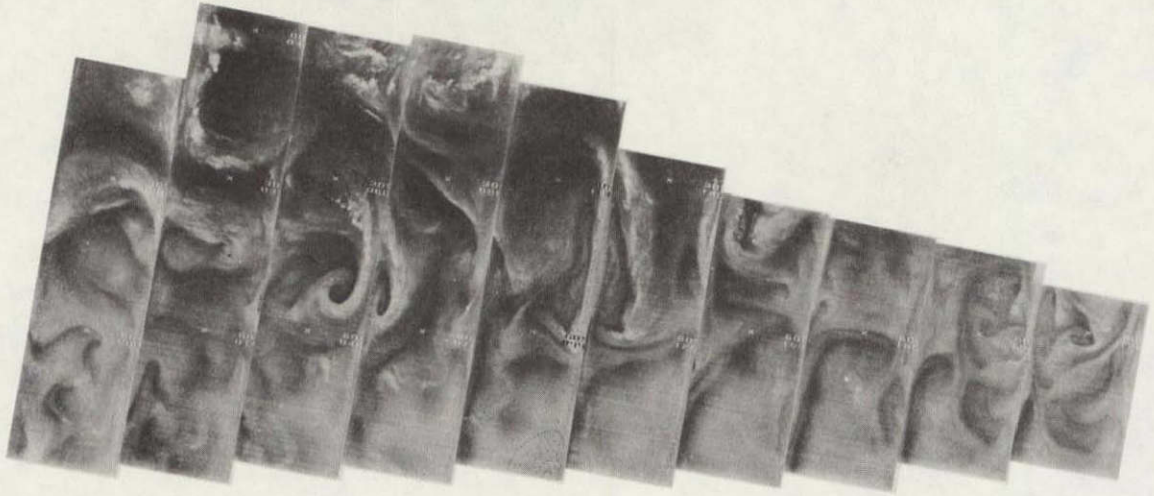
7083 7082 7081 7080 7079 7078 7077 7076 7075 7074 7073 7072 7071

21 NOV 76

6.7μm

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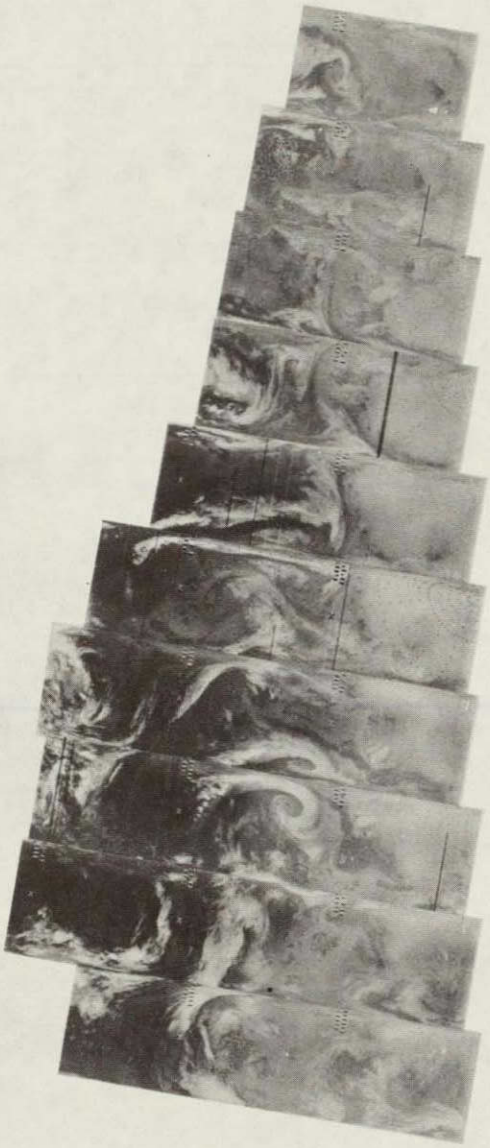


7097 7096 7095 7094 7093 7092 7091 7090 7089 7088 7087 7086 7085 7084

22 NOV 76

6.7μm

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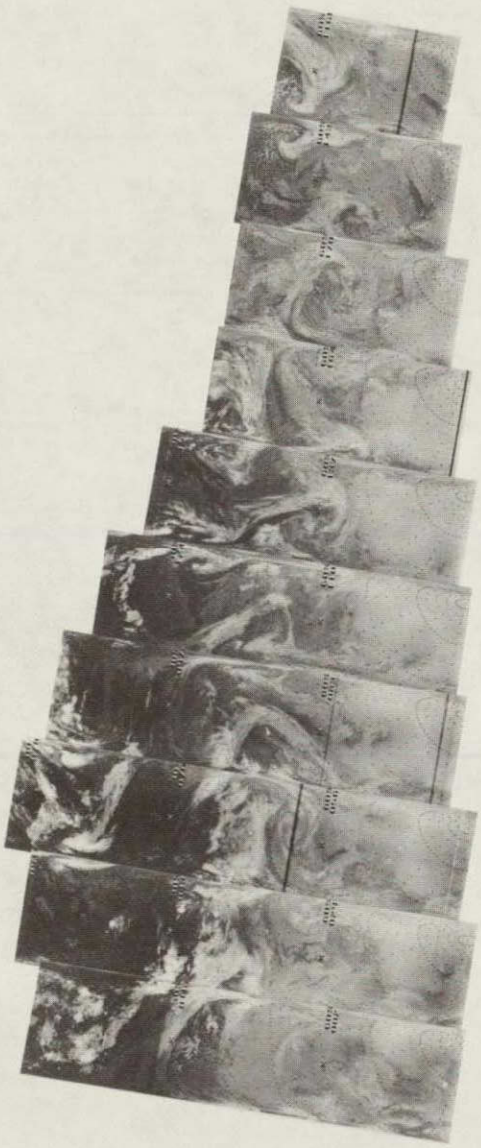
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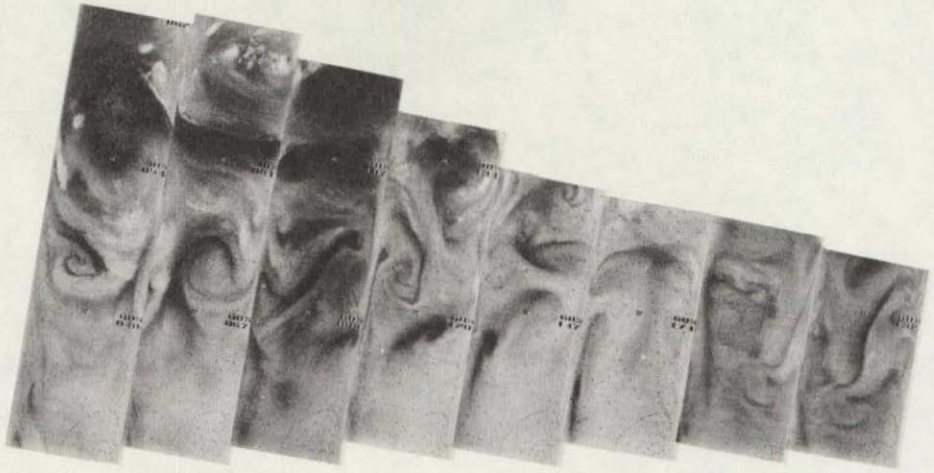
23 NOV 76

6.7μm



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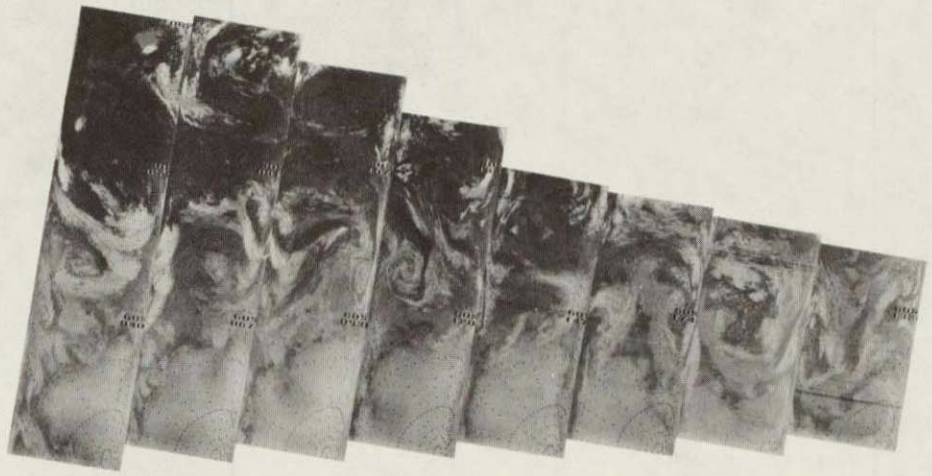




7123 7122 7121 7120 7119 7118 7117 7116 7115 7114 7113 7112 7111

24 NOV 76

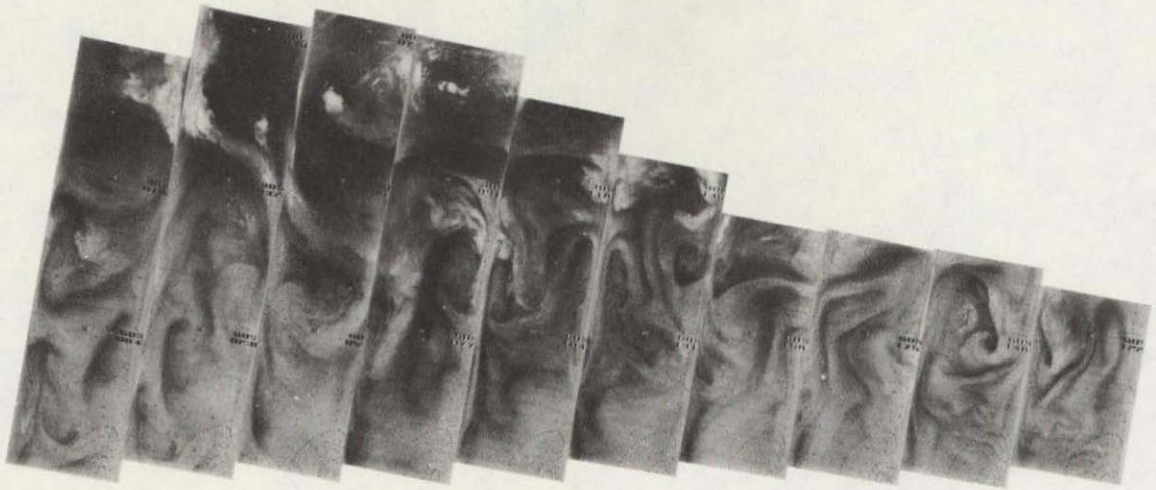
6.7μm



7123 7122 7121 7120 7119 7118 7117 7116 7115 7114 7113 7112 7111

24 NOV 76

11.5μm



7137 7136 7135 7134 7133 7132 7131 7130 7129 7128 7127 7126 7125 7124

25 NOV 76

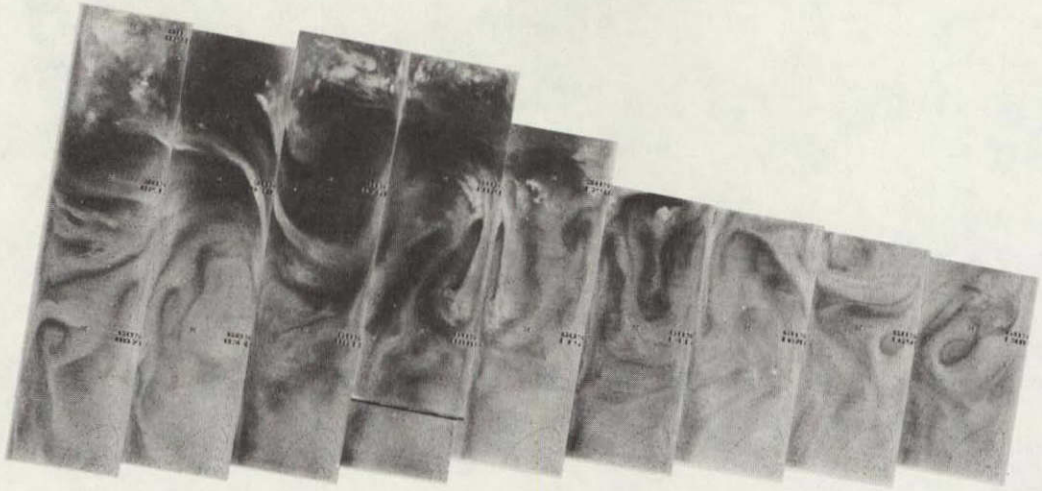
6.7μm

7137 7136 7135 7134 7133 7132 7131 7130 7129 7128 7127 7126 7125 7124

25 NOV 76

11.5μm

REPRODUCIBILITY OF THE
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7150 7149 7148 7147 7146 7145 7144 7143 7142 7141 7140 7139 7138

26 NOV 76

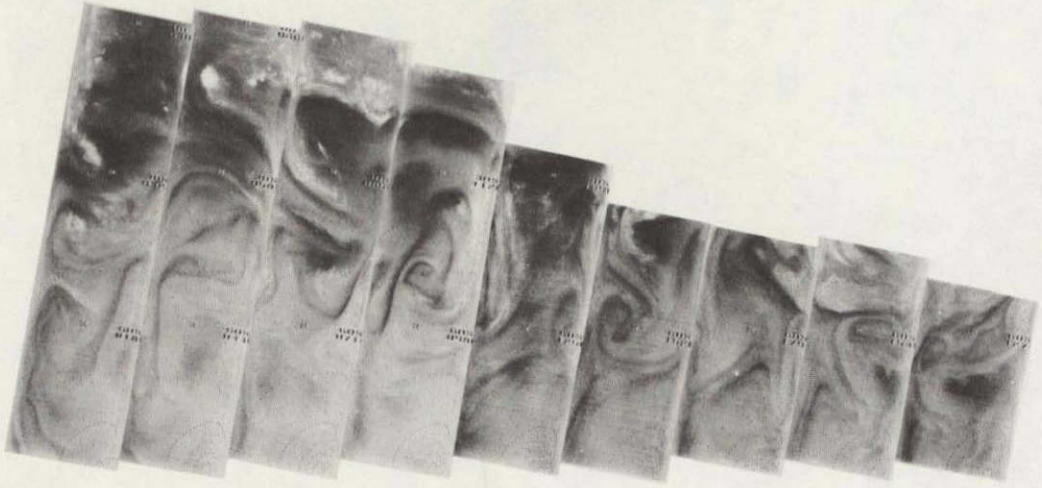
6.7μm

7150 7149 7148 7147 7146 7145 7144 7143 7142 7141 7140 7139 7138

26 NOV 76

11.5μm

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR.



7164 7163 7162 7161 7160 7159 7158 7157 7156 7155 7154 7153 7152 7151

27 NOV 76

6.7μm

7164 7163 7162 7161 7160 7159 7158 7157 7156 7155 7154 7153 7152 7151

27 NOV 76

11.5μm



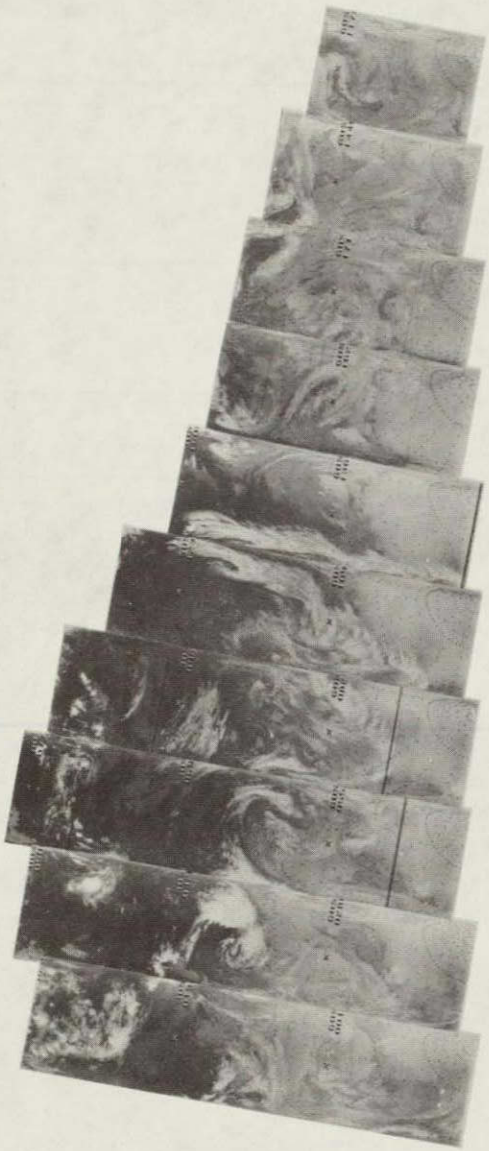
7177 7176 7175 7174 7173 7172 7171 7170 7169 7168 7167 7166 7165

28 NOV 76

6.7μm



REPRODUCIBILITY OF THE
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7190 7189 7188 7187 7186 7185 7184 7183 7182 7181 7180 7179 7178

29 NOV 76

6.7μm

7190 7189 7188 7187 7186 7185 7184 7183 7182 7181 7180 7179 7178

29 NOV 76

11.5μm

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7204 7203 7202 7201 7200 7199 7198 7197 7196 7195 7194 7193 7192 7191

30 NOV 76

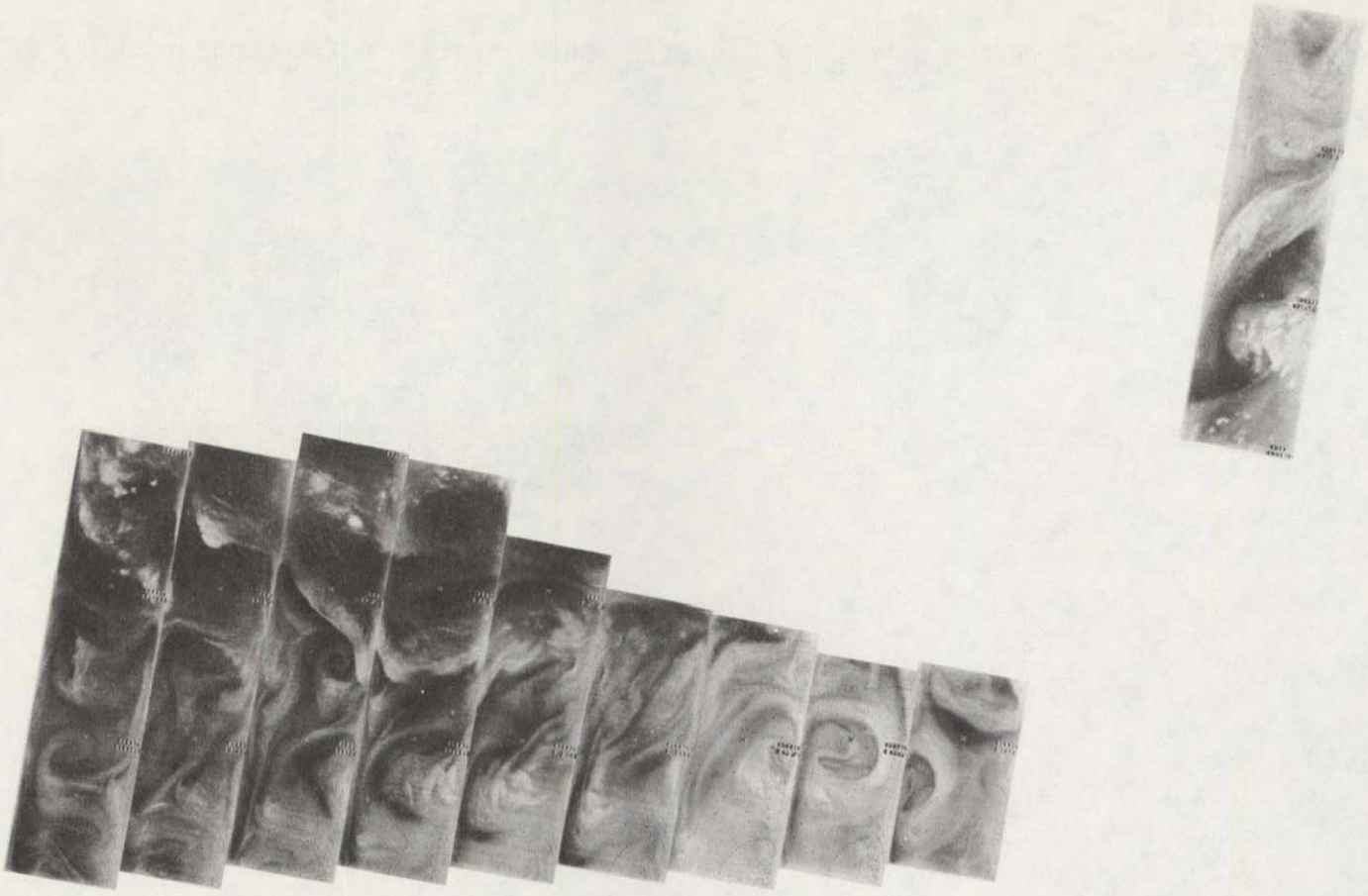
6.7μm

7204 7203 7202 7201 7200 7199 7198 7197 7196 7195 7194 7193 7192 7191

30 NOV 76

11.5μm

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR.



7217 7216 7215 7214 7213 7212 7211 7210 7209 7208 7207 7206 7205

1 DEC 76

6.7μm

7217 7216 7215 7214 7213 7212 7211 7210 7209 7208 7207 7206 7205

1 DEC 76

11.5μm

REPRODUCIBILITY OF THE
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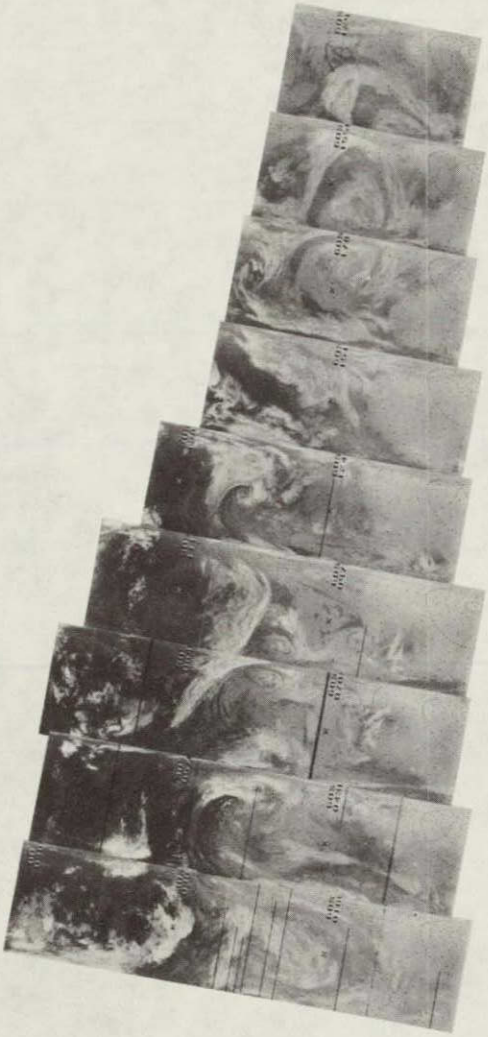
7231 7230 7229 7228 7227 7226 7225 7224 7223 7222 7221 7220 7219 7218

2 DEC 76

6.7μm

REPRODUCIBILITY OF THE
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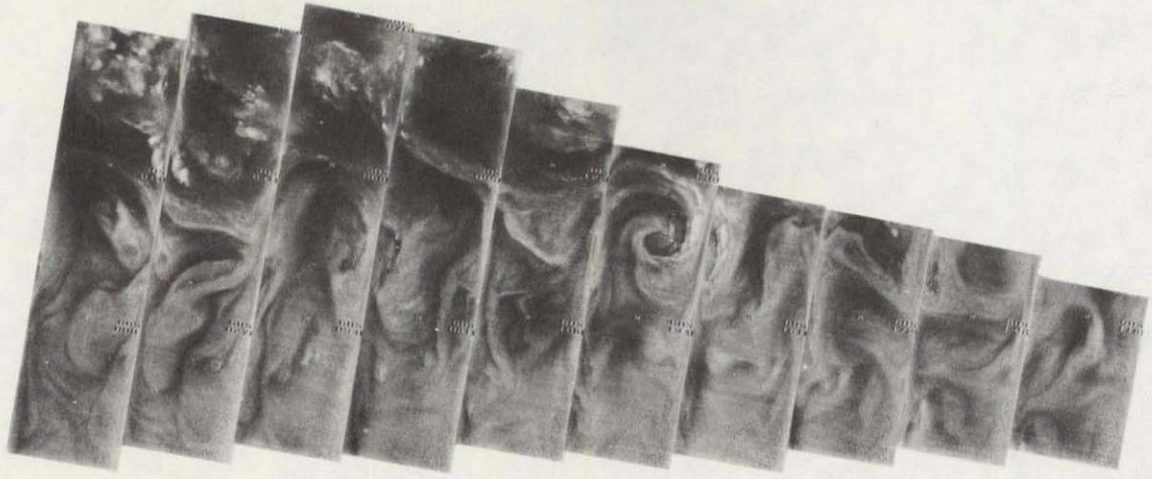




7231 7230 7229 7228 7227 7226 7225 7224 7223 7222 7221 7220 7219 7218

2 DEC 76

11.5μm

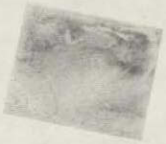


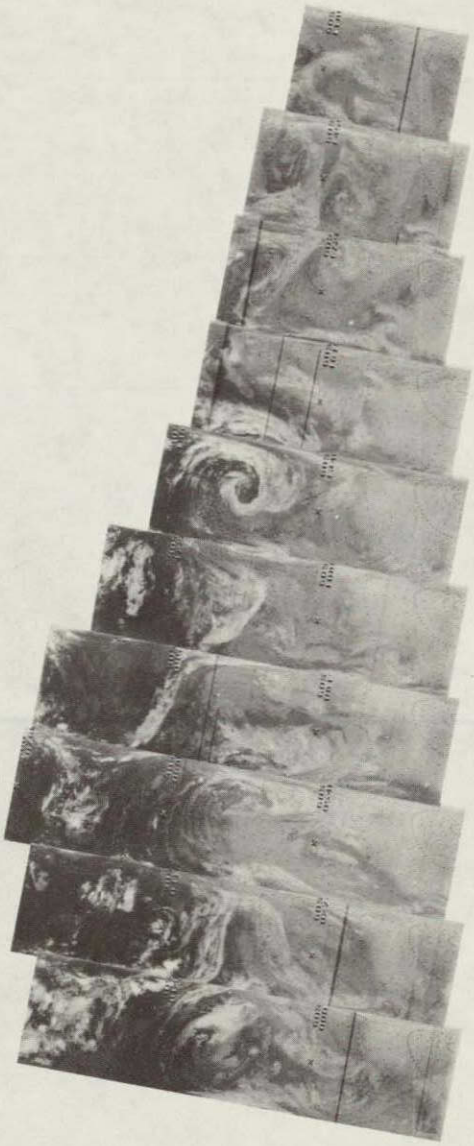
7244 7243 7242 7241 7240 7239 7238 7237 7236 7235 7234 7233 7232

3 DEC 76

6.7μm

REPRODUCIBILITY OF THE
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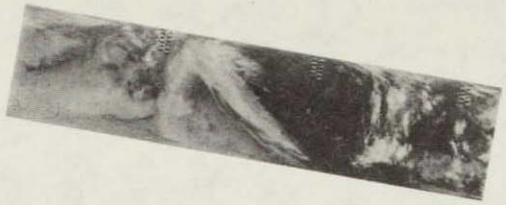


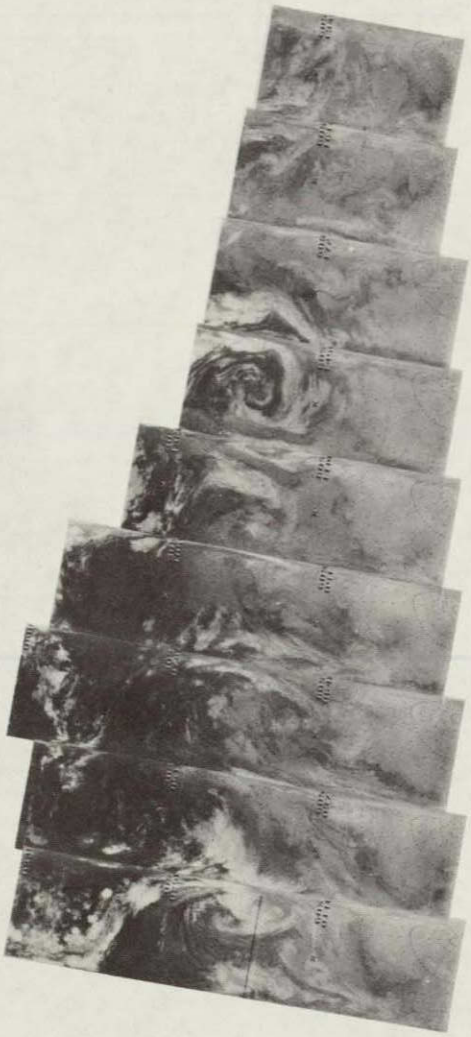
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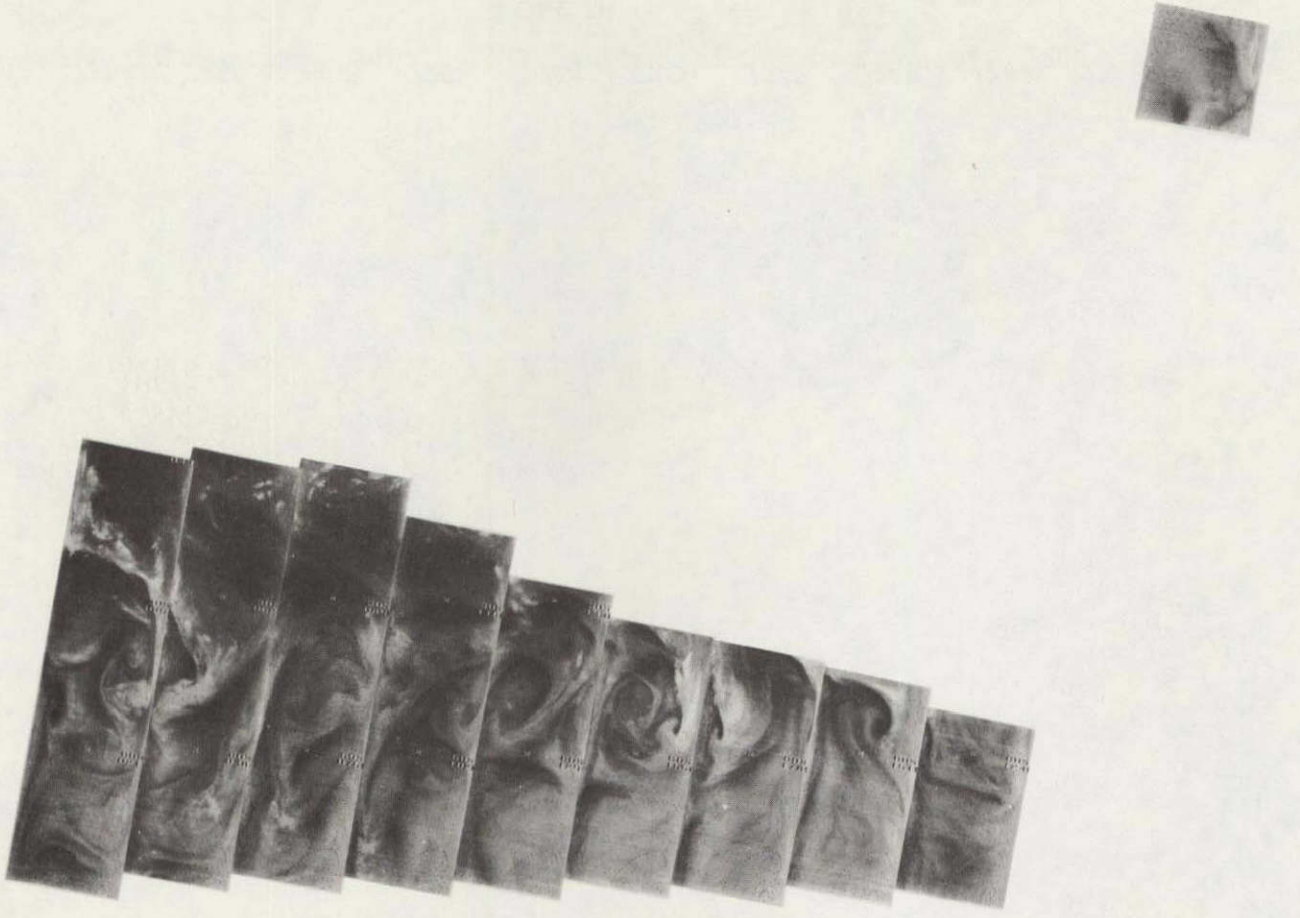
4 DEC 76

6.7μm

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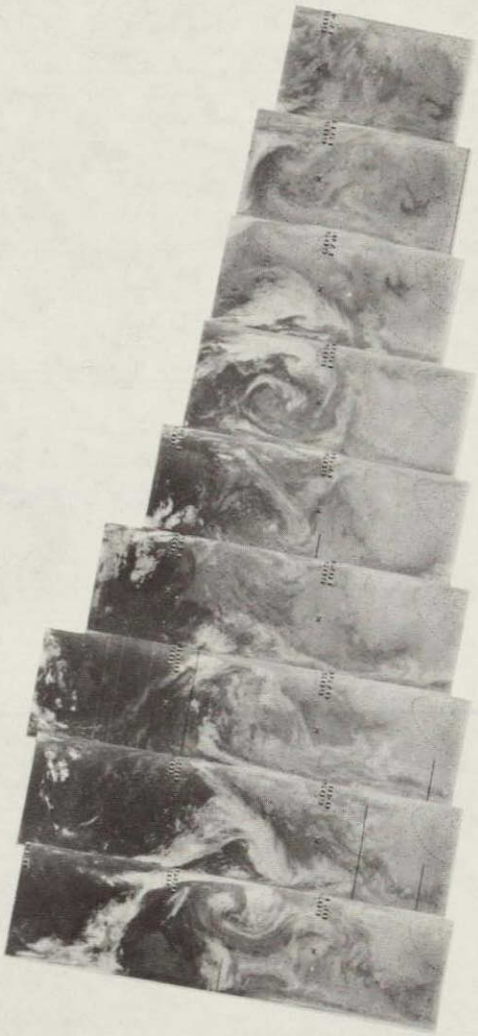
7271 7270 7269 7268 7267 7266 7265 7264 7263 7262 7261 7260 7259 7258

5 DEC 76

6.7μm

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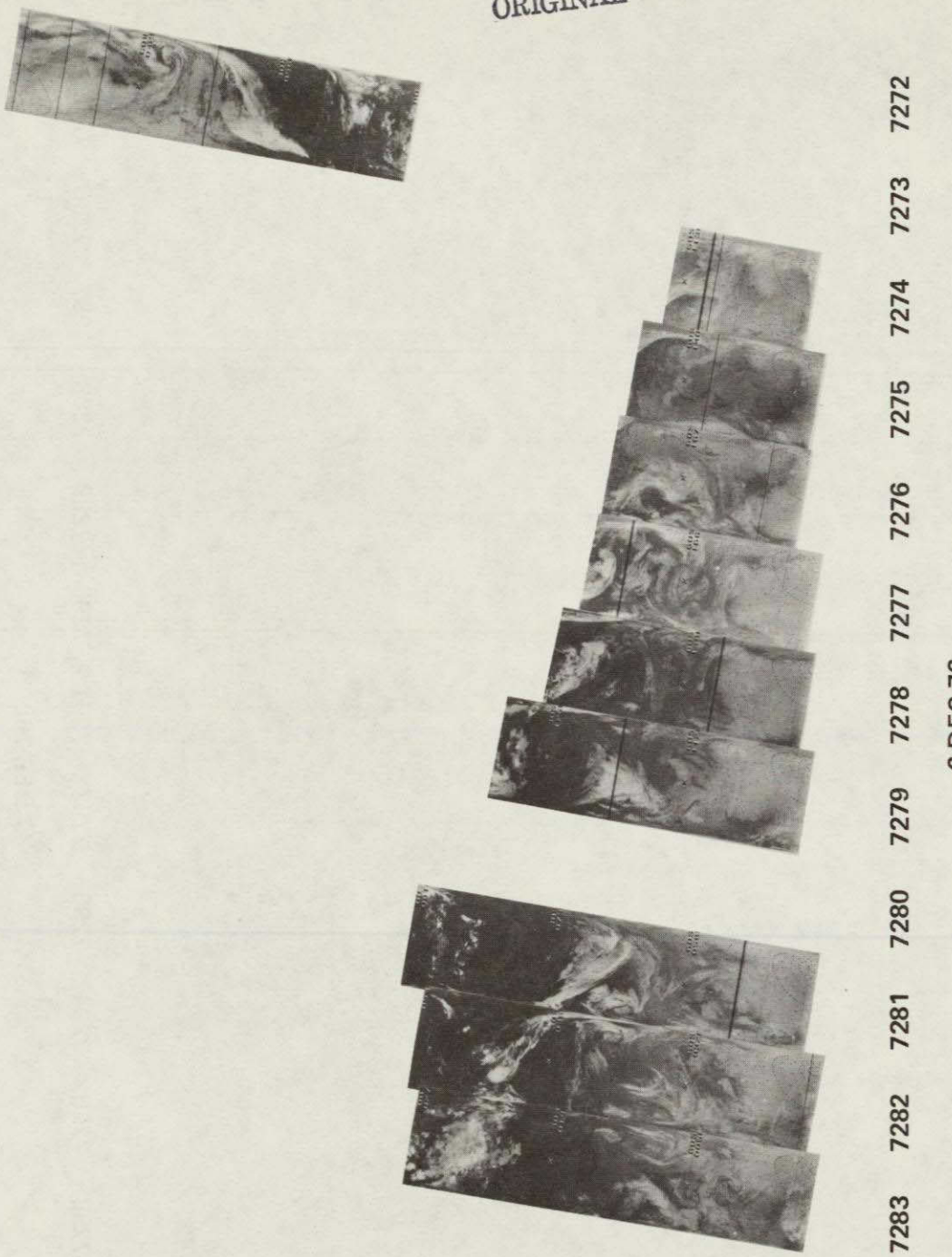


7284 7283 7282 7281 7280 7279 7278 7277 7276 7275 7274 7273 7272

6 DEC 76

6.7μm

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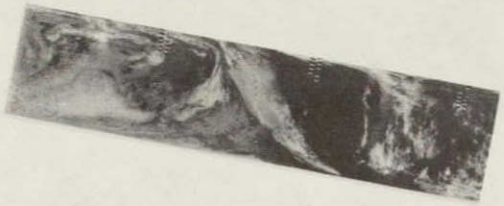


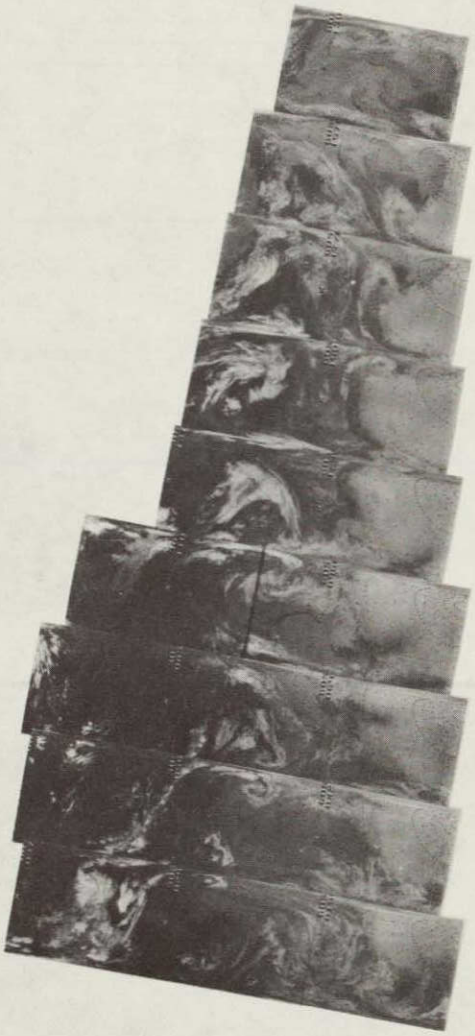
7298 7297 7296 7295 7294 7293 7292 7291 7290 7289 7288 7287 7286 7285

7 DEC 76

6.7μm

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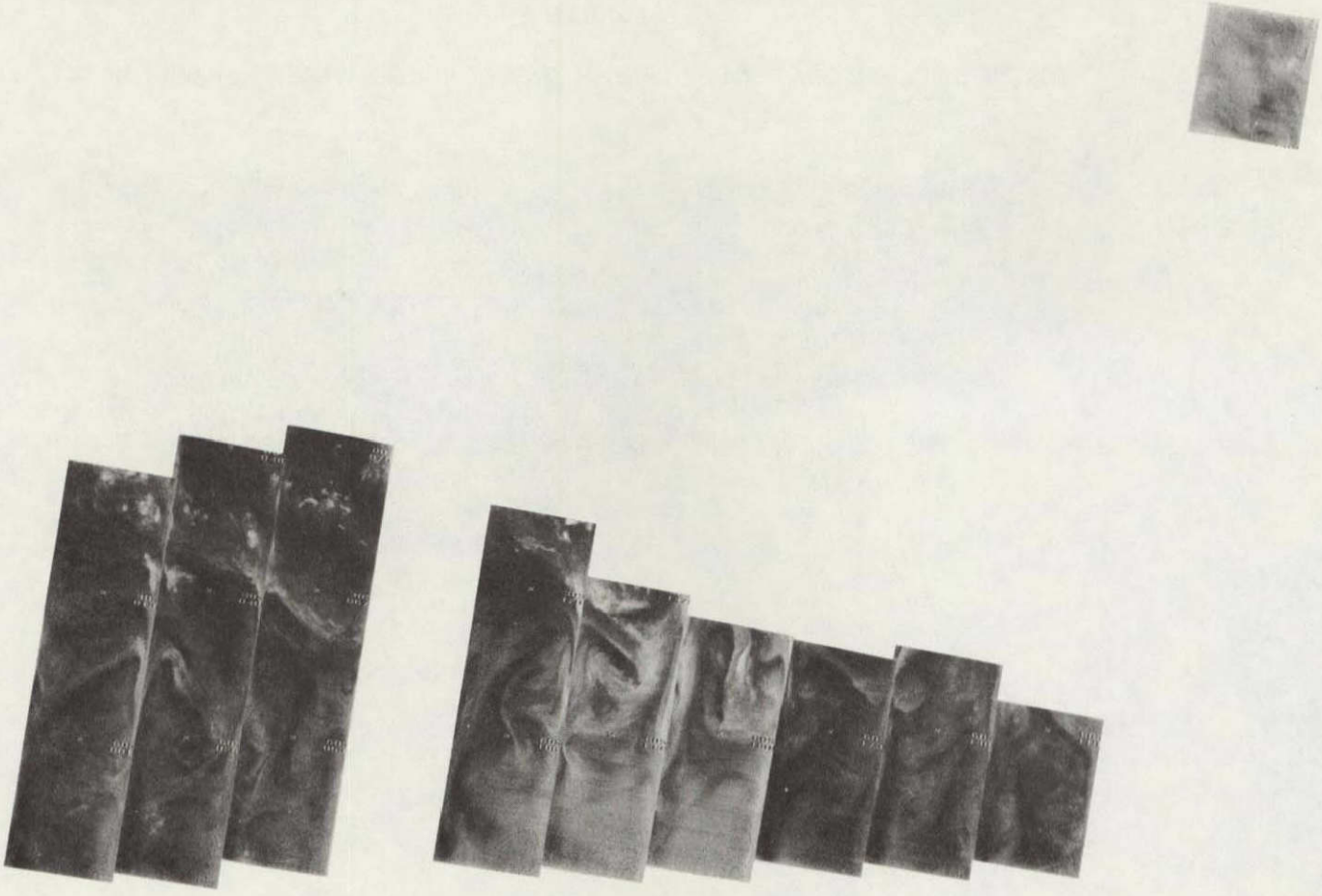




7285 7286 7287 7288 7289 7290 7291 7292 7293 7294 7295 7296 7297 7298

7 DEC 76

11.5μm



7311 7310 7309 7308 7307 7306 7305 7304 7303 7302 7301 7300 7299

8 DEC 76

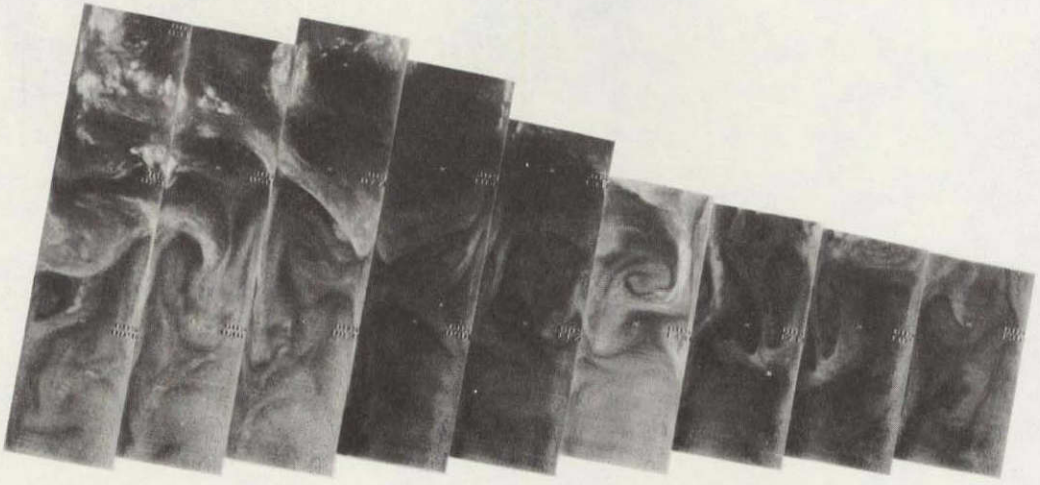
6.7μm

7311 7310 7309 7308 7307 7306 7305 7304 7303 7302 7301 7300 7299

8 DEC 76

11.5μm

REPRODUCIBILITY OF THE
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7324 7323 7322 7321 7320 7319 7318 7317 7316 7315 7314 7313 7312

9 DEC 76

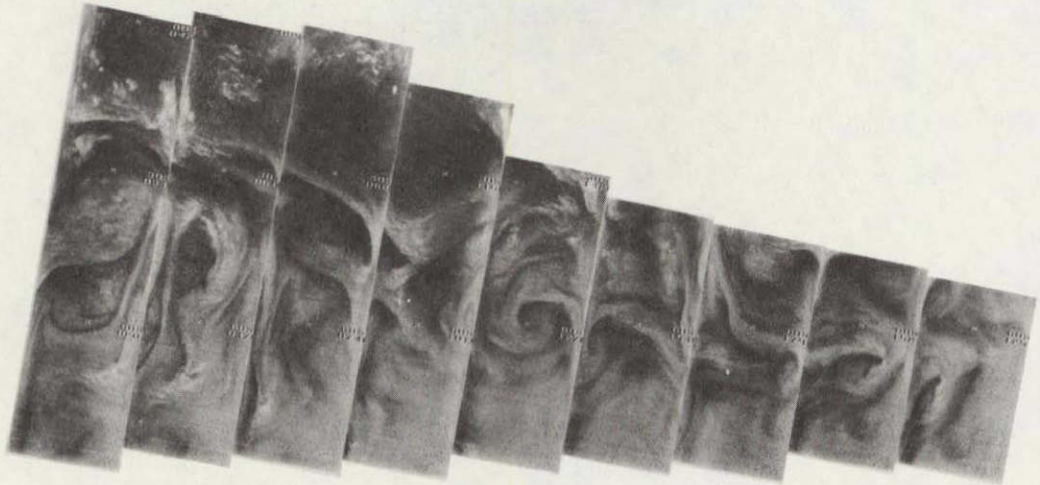
6.7μm

7324 7323 7322 7321 7320 7319 7318 7317 7316 7315 7314 7313 7312

9 DEC 76

11.5μm

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7338 7337 7336 7335 7334 7333 7332 7331 7330 7329 7328 7327 7326 7325

10 DEC 76

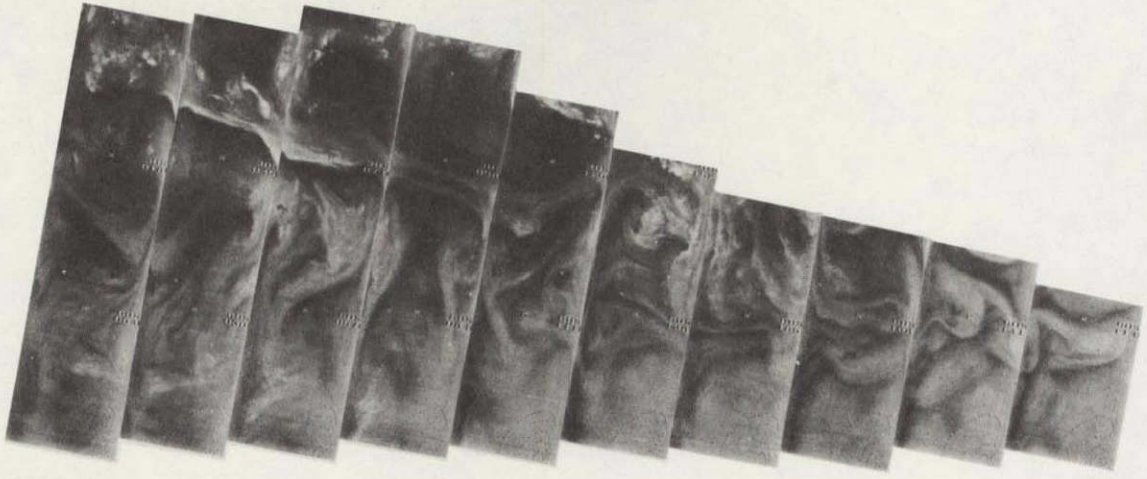
6.7μm

7338 7337 7336 7335 7334 7333 7332 7331 7330 7329 7328 7327 7326 7325

10 DEC 76

11.5μm

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7351 7350 7349 7348 7347 7346 7345 7344 7343 7342 7341 7340 7339

11 DEC 76

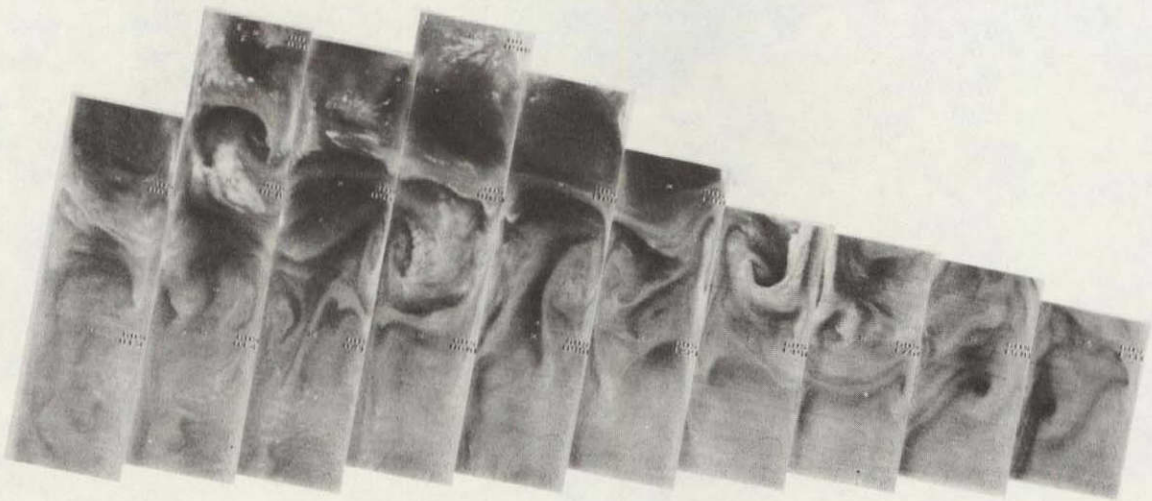
6.7μm

7351 7350 7349 7348 7347 7346 7345 7344 7343 7342 7341 7340 7339

11 DEC 76

11.5μm

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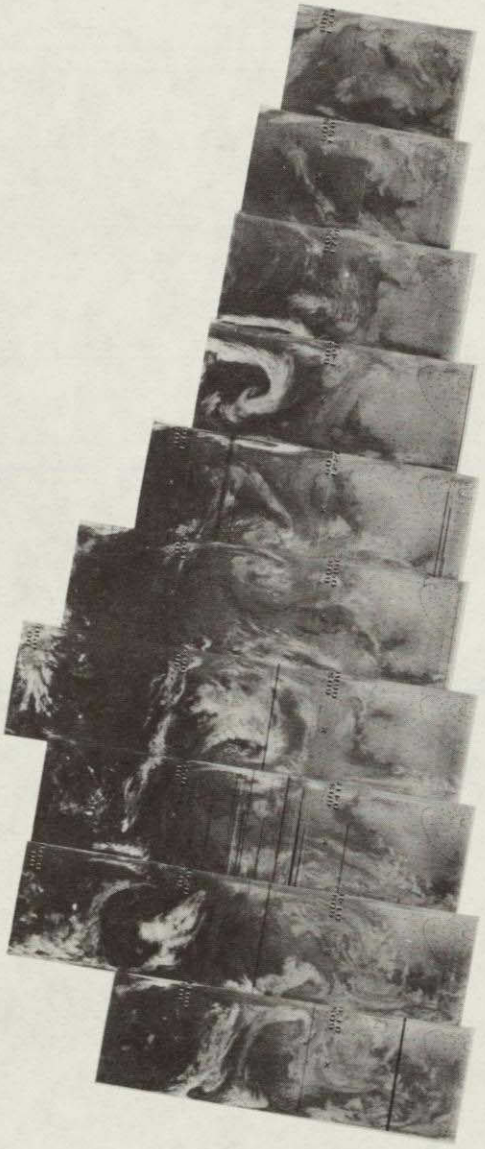
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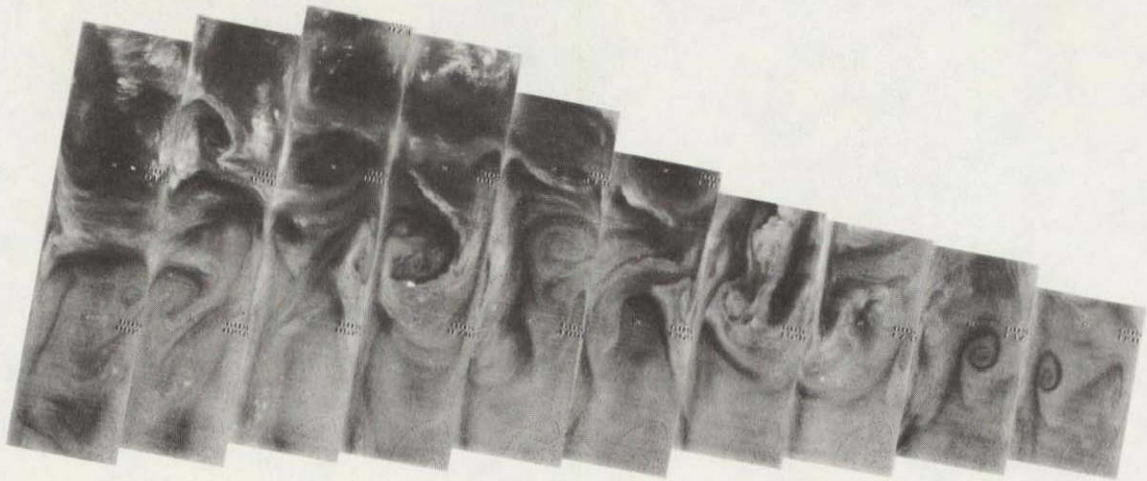
12 DEC 76

6.7μm



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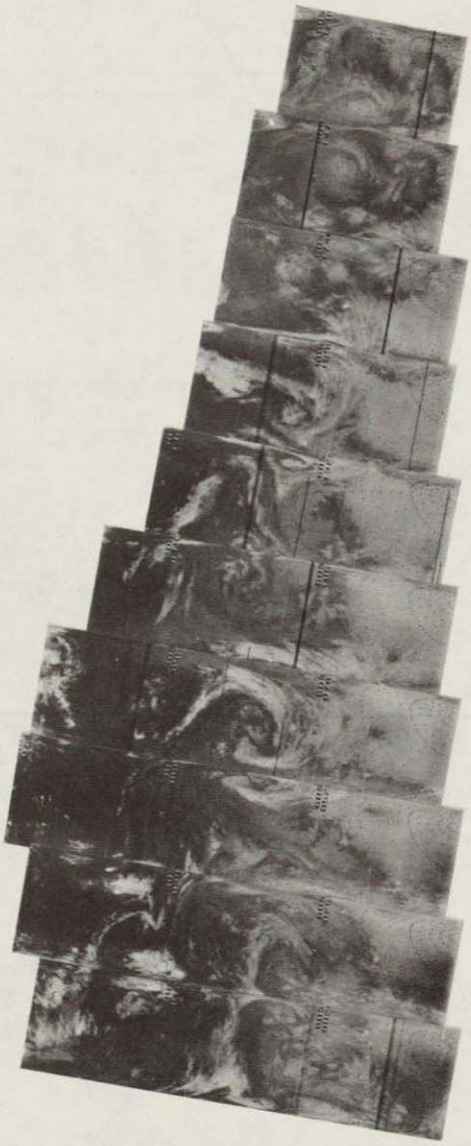
7378 7377 7376 7375 7374 7373 7372 7371 7370 7369 7368 7367 7366

13 DEC 76

6.7μm



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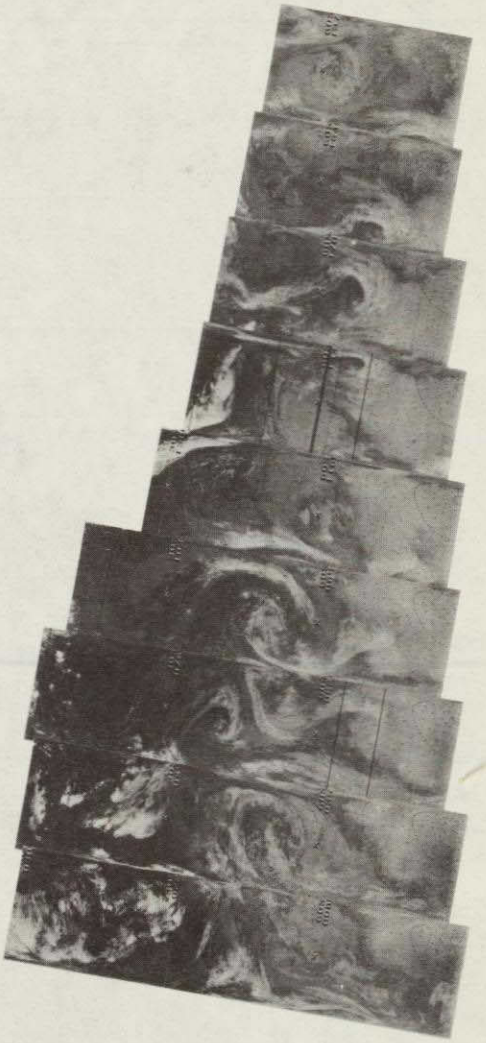
7391 7390 7389 7388 7387 7386 7385 7384 7383 7382 7381 7380 7379

14 DEC 76

6.7μm

REPRODUCIBILITY OF THE
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7405 7404 7403 7402 7401 7400 7399 7398 7397 7396 7395 7394 7393 7392

15 DEC 76

6.7μm

7405 7404 7403 7402 7401 7400 7399 7398 7397 7396 7395 7394 7393 7392

15 DEC 76

11.5μm

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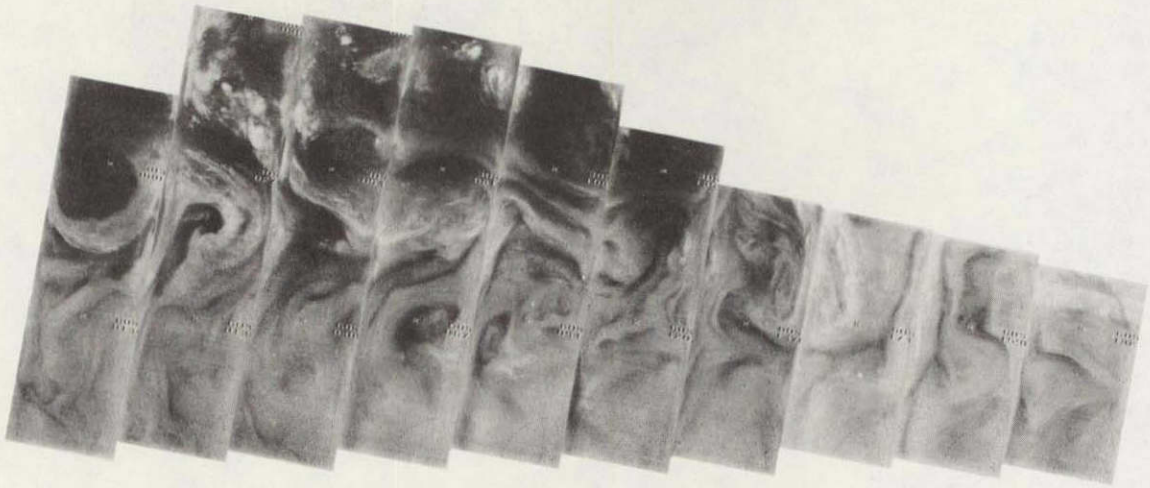
7418 7417 7416 7415 7414 7413 7412 7411 7410 7409 7408 7407 7406

16 DEC 76

6.7μm

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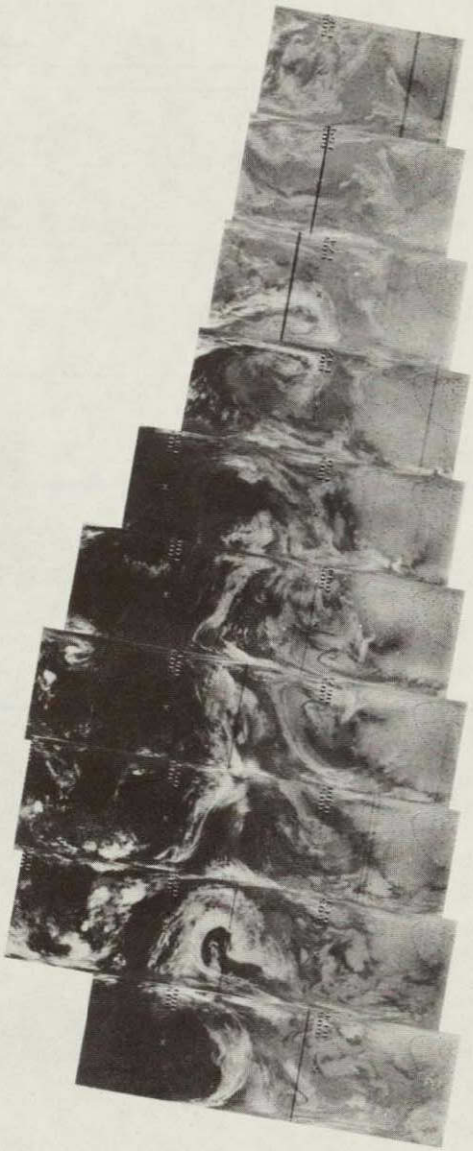
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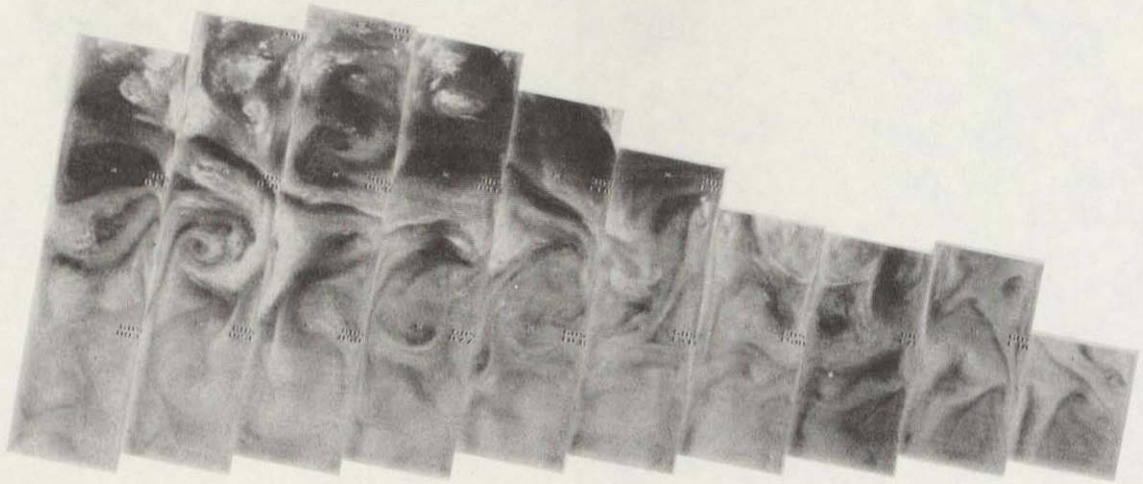
17 DEC 76

6.7μm

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR







7445 7444 7443 7442 7441 7440 7439 7438 7437 7436 7435 7434 7433 7432

18 DEC 76

6.7μm

7445 7444 7443 7442 7441 7440 7439 7438 7437 7436 7435 7434 7433 7432

18 DEC 76

11.5μm

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ORIGINAL PAGE IS POOR

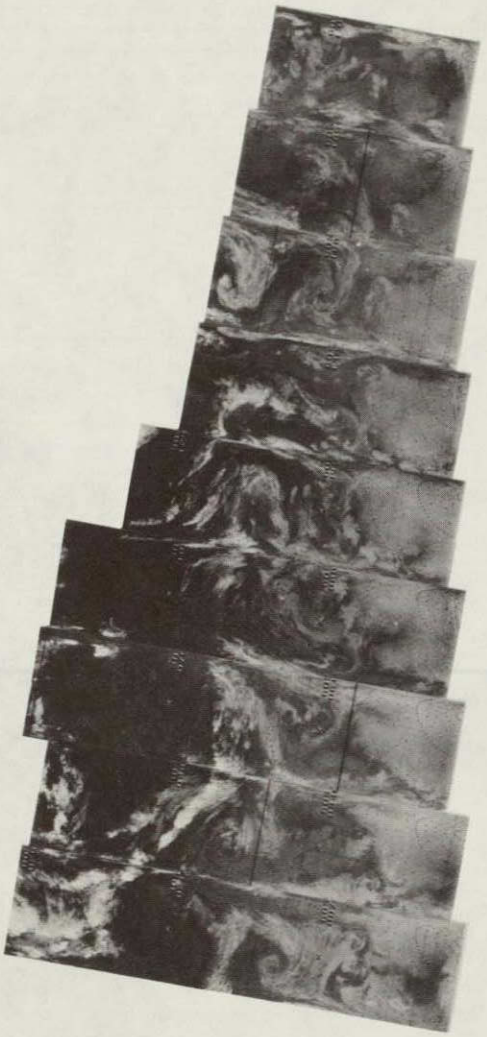


7458 7457 7456 7455 7454 7453 7452 7451 7450 7449 7448 7447 7446

19 DEC 76

6.7μm

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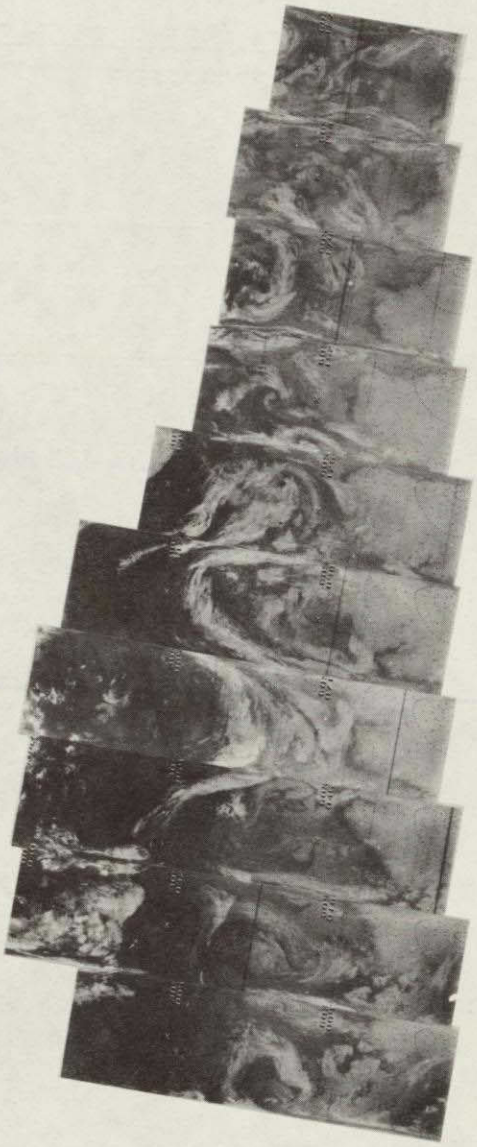
7472 7471 7470 7469 7468 7467 7466 7465 7464 7463 7462 7461 7460 7459

20 DEC 76

6.7μm



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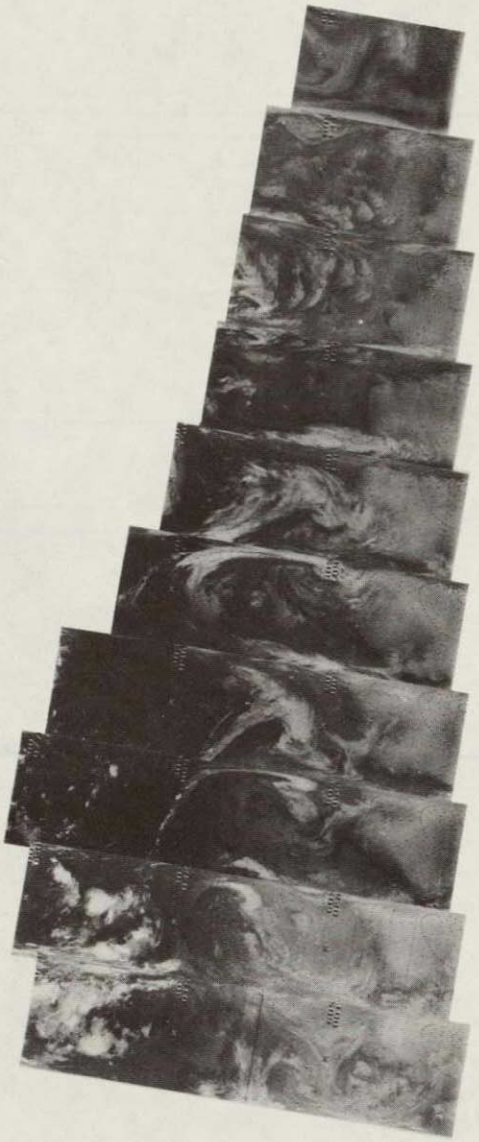
7485 7484 7483 7482 7481 7480 7479 7478 7477 7476 7475 7474 7473

21 DEC 76

6.7μm



REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR



7498 7497 7496 7495 7494 7493 7492 7491 7490 7489 7488 7487 7486

22 DEC 76

6.7μm

7498 7497 7496 7495 7494 7493 7492 7491 7490 7489 7488 7487 7486

22 DEC 76

11.5μm

REPRODUCIBILITY OF THE
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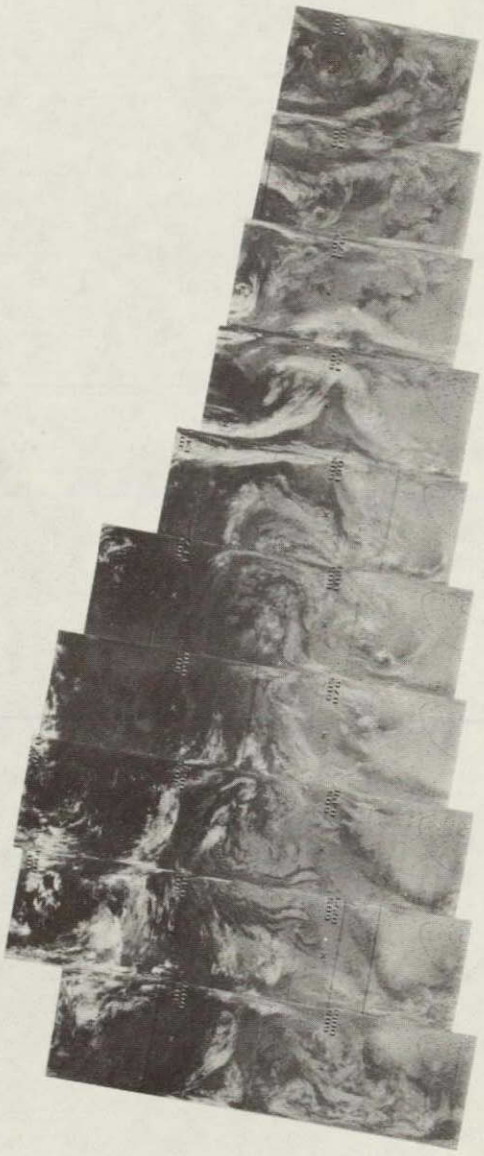
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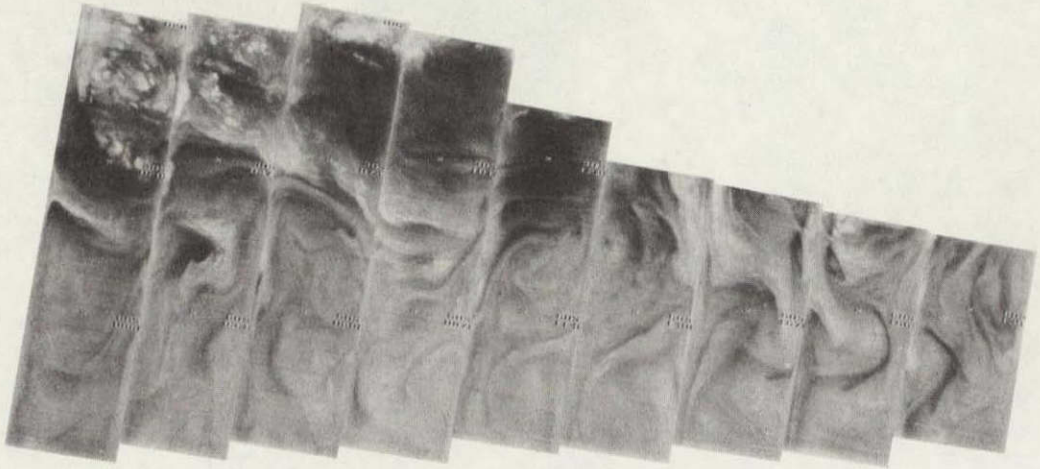
23 DEC 76

6.7μm



REPRODUCIBILITY OF THE
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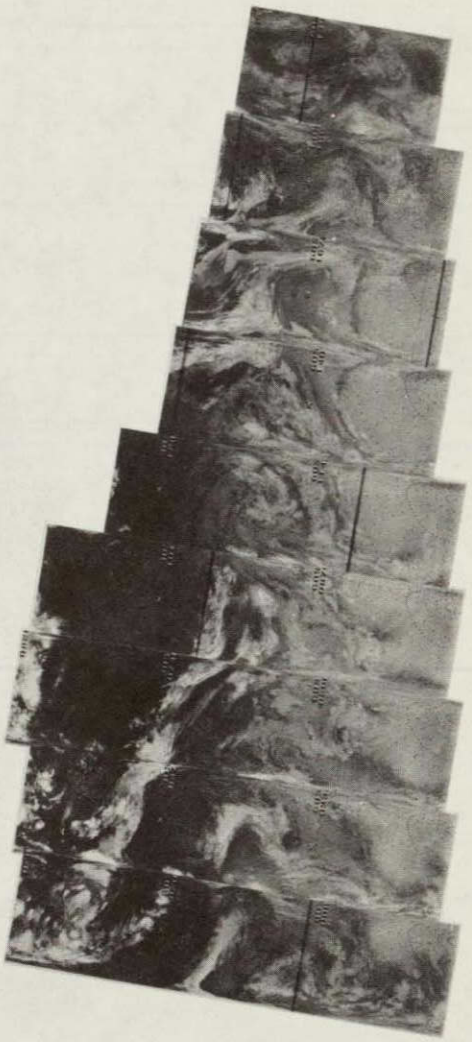


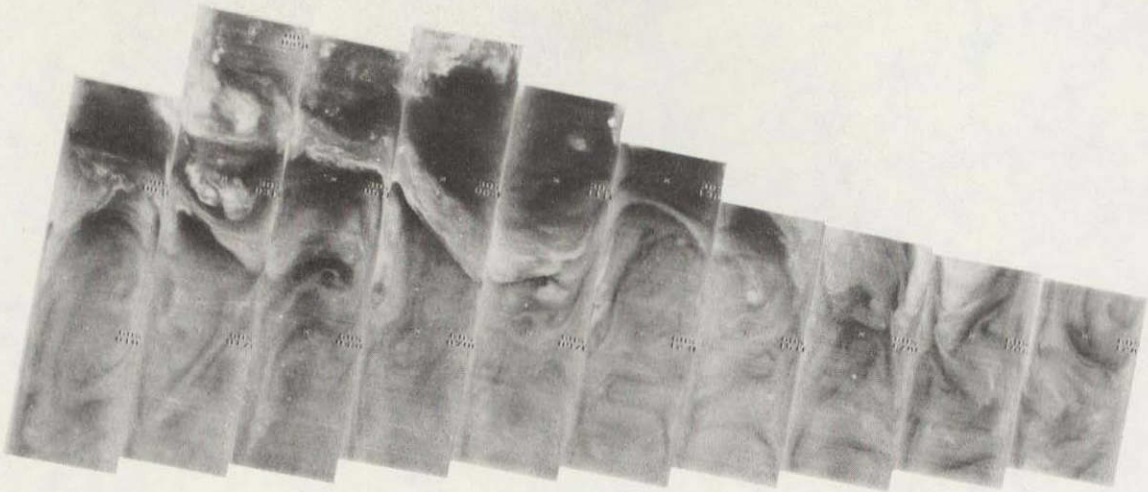
7525 7524 7523 7522 7521 7520 7519 7518 7517 7516 7515 7514 7413

24 DEC 76

6.7μm

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR





7539 7538 7537 7536 7535 7534 7533 7532 7531 7530 7529 7528 7527 7526

25 DEC 76

6.7μm

7539 7538 7537 7536 7535 7534 7533 7532 7531 7530 7529 7528 7527 7526

25 DEC 76

11.5μm

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

7552 7551 7550 7549 7548 7547 7546 7545 7544 7543 7542 7541 7540

26 DEC 76

6.7μm

7552 7551 7550 7549 7548 7547 7546 7545 7544 7543 7542 7541 7540

26 DEC 76

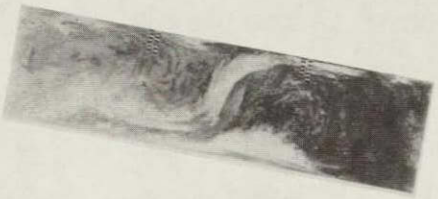
11.5μm

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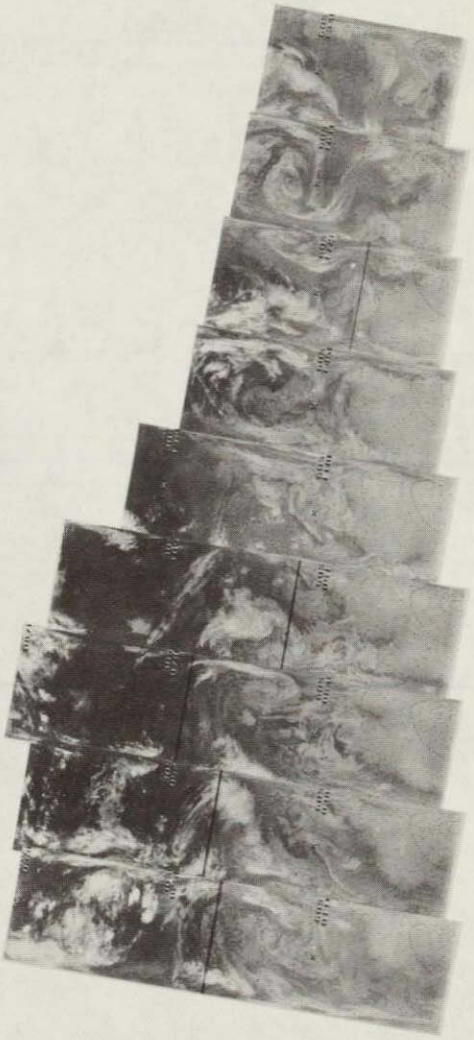
7565 7564 7563 7562 7561 7560 7559 7558 7557 7556 7555 7554 7553

27 DEC 76

6.7μm



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27 DEC 76

11.5μm

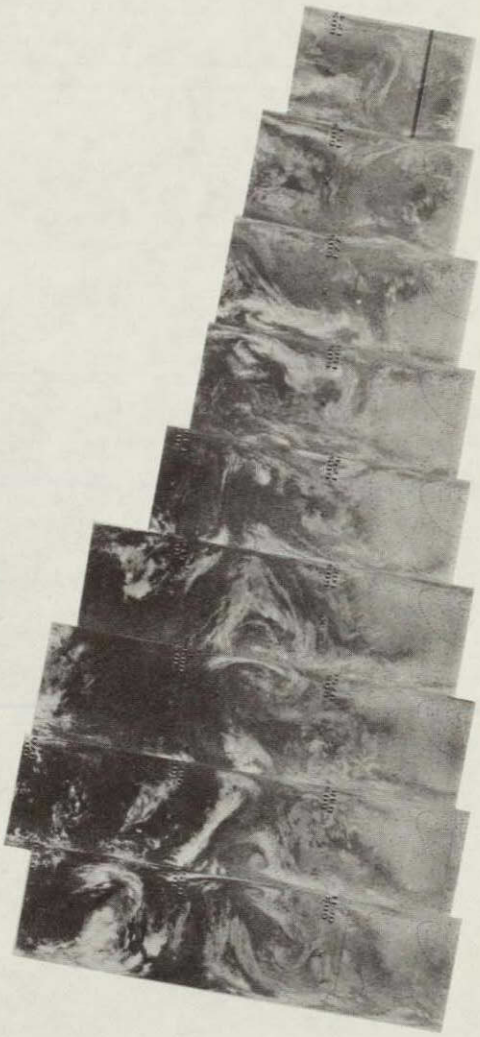
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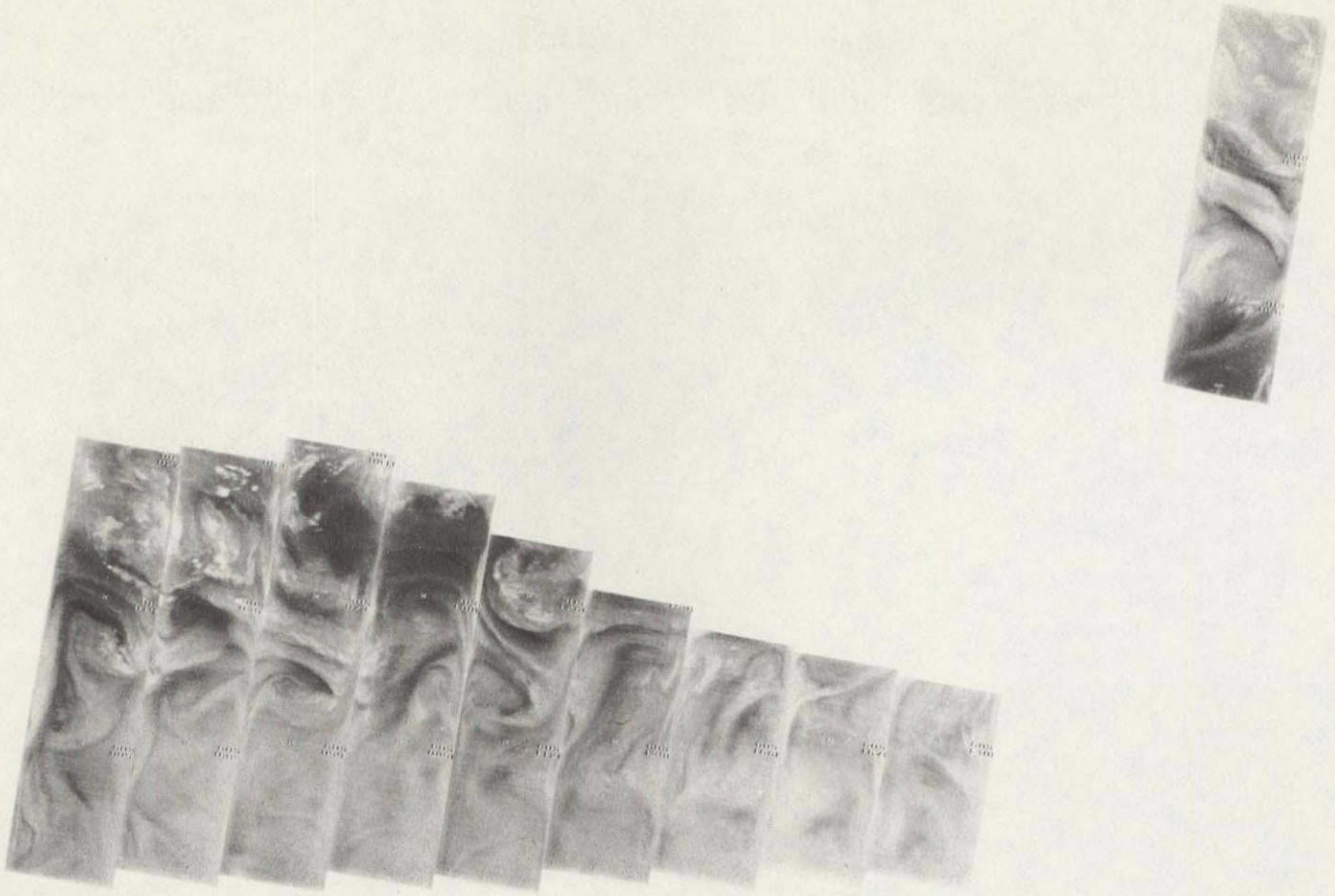
28 DEC 76

6.7μm



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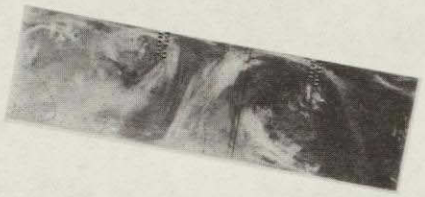


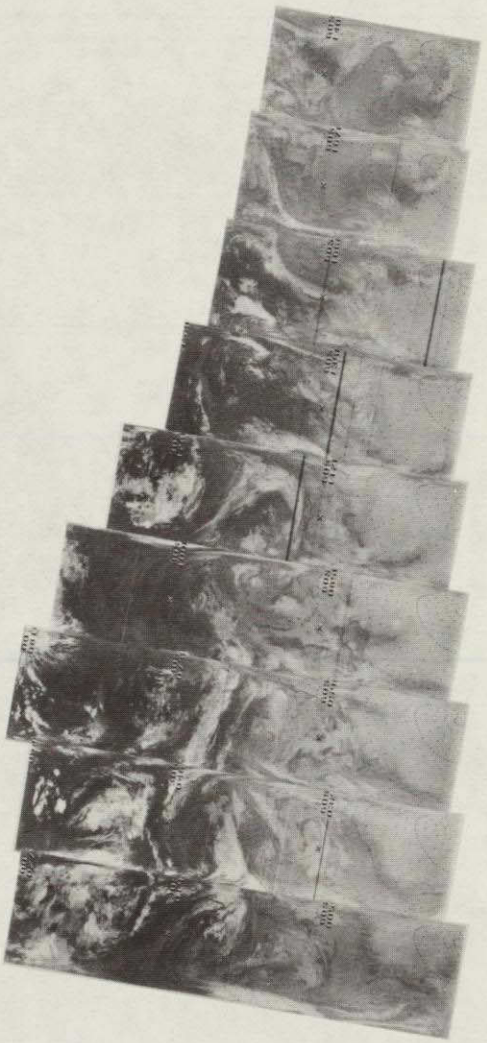
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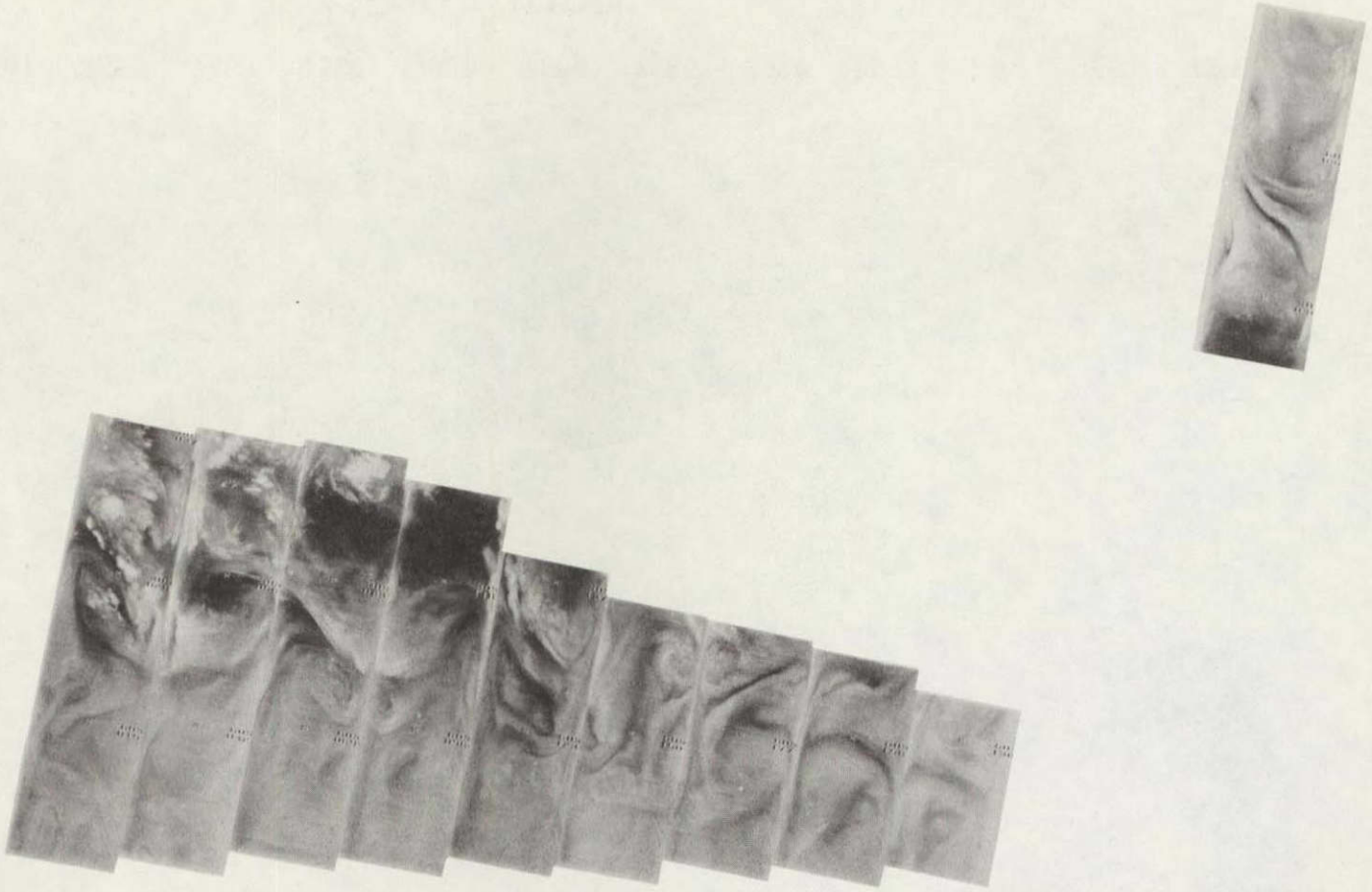
29 DEC 76

6.7μm

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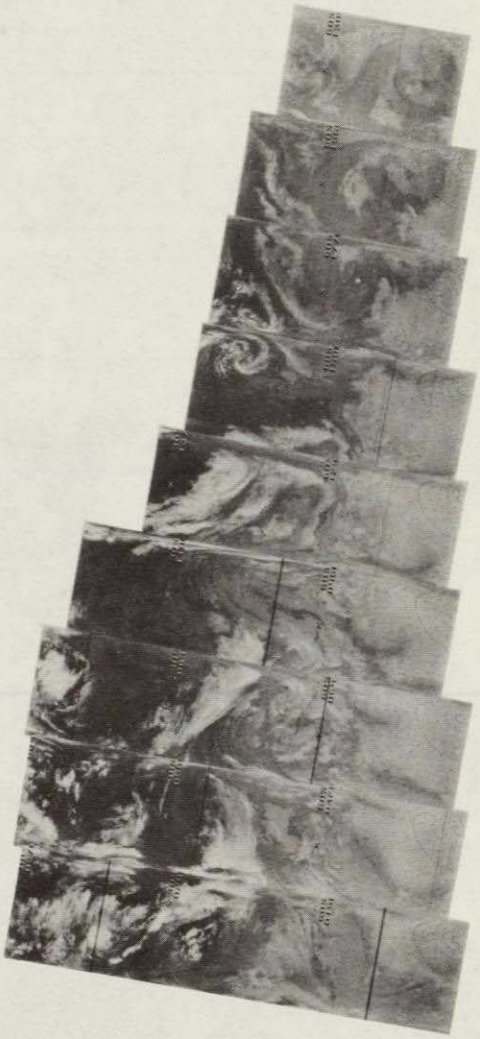
7606 7605 7604 7603 7602 7601 7600 7599 7598 7597 7596 7595 7594 7593

30 DEC 76

6.7μm

REPRODUCIBILITY OF THE
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7619 7618 7617 7616 7615 7614 7613 7612 7611 7610 7609 7608 7607

31 DEC 76

6.7μm

REPRODUCIBILITY OF THE
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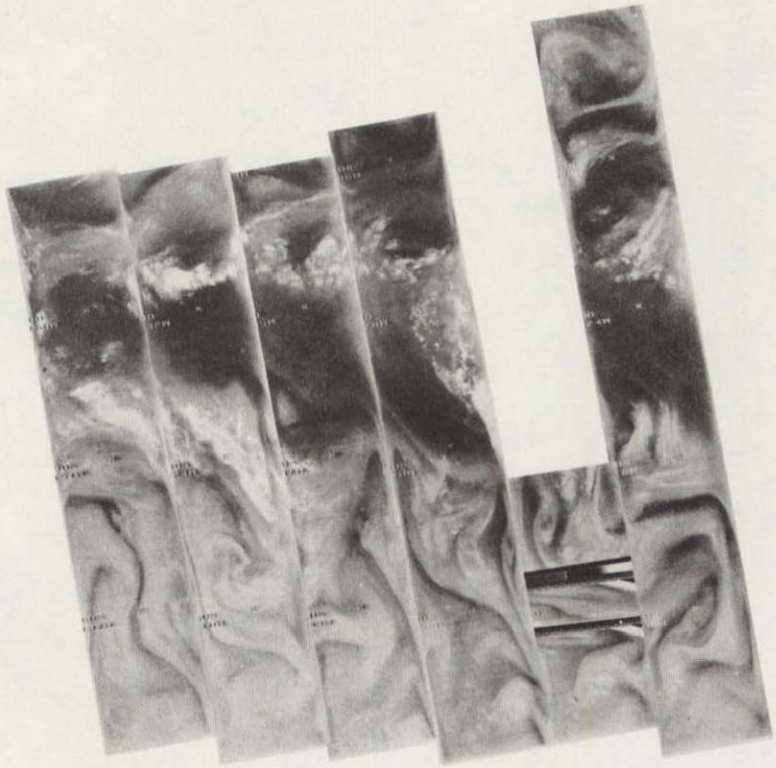


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SECTION 4.2

TEMPERATURE HUMIDITY INFRARED RADIOMETER

DAYTIME MONTAGES



6815 6814 6813 6812 6811 6810 6809 6808 6807 6806 6805 6804 6803

1 NOV 76

6.7μm

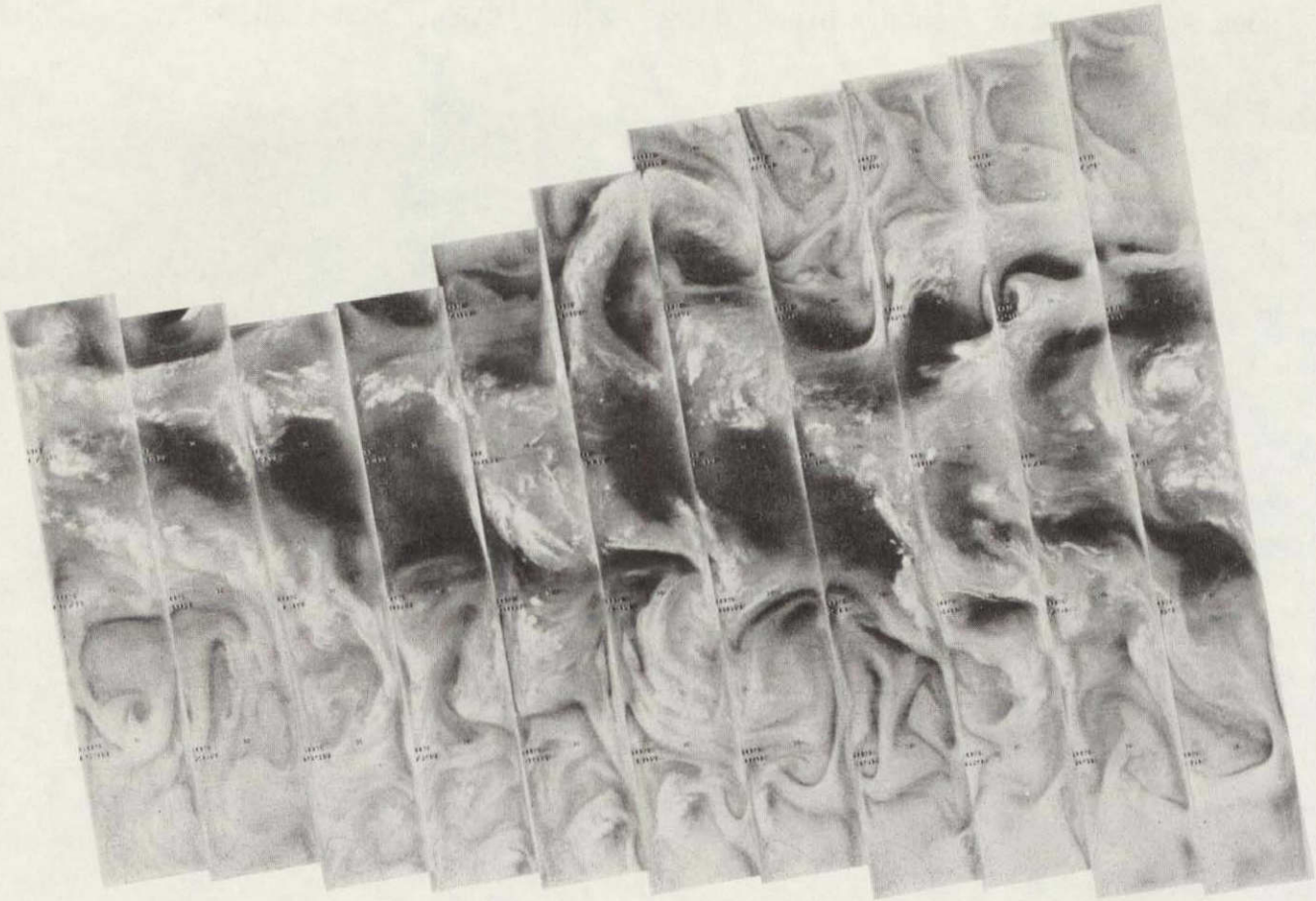
6815 6814 6813 6812 6811 6810 6809 6808 6807 6806 6805 6804 6803

1 NOV 76

11.5μm

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C-3



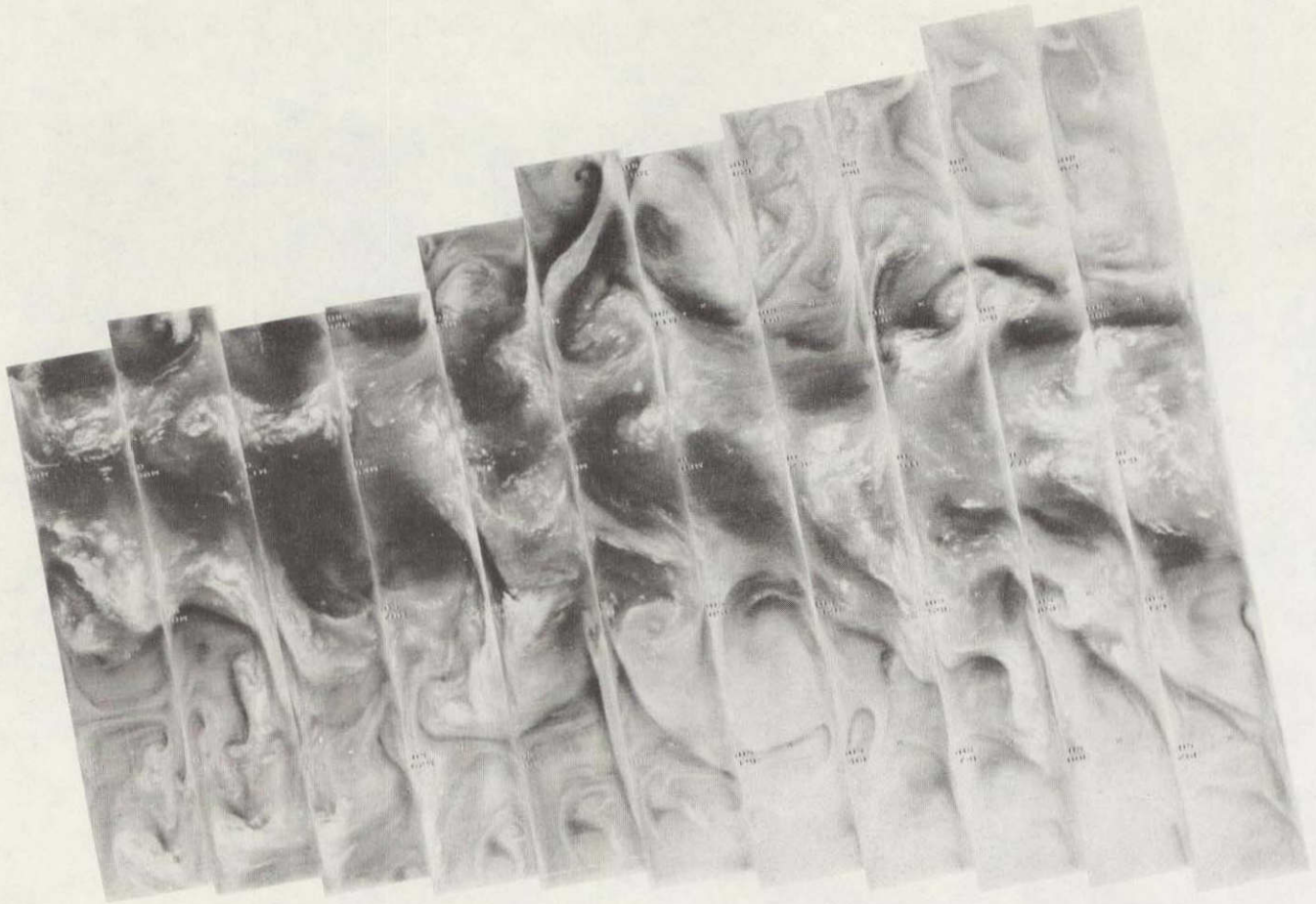
6829 6828 6827 6826 6825 6824 6823 6822 6821 6820 6819 6818 6817 6816

2 NOV 76

6.7μm

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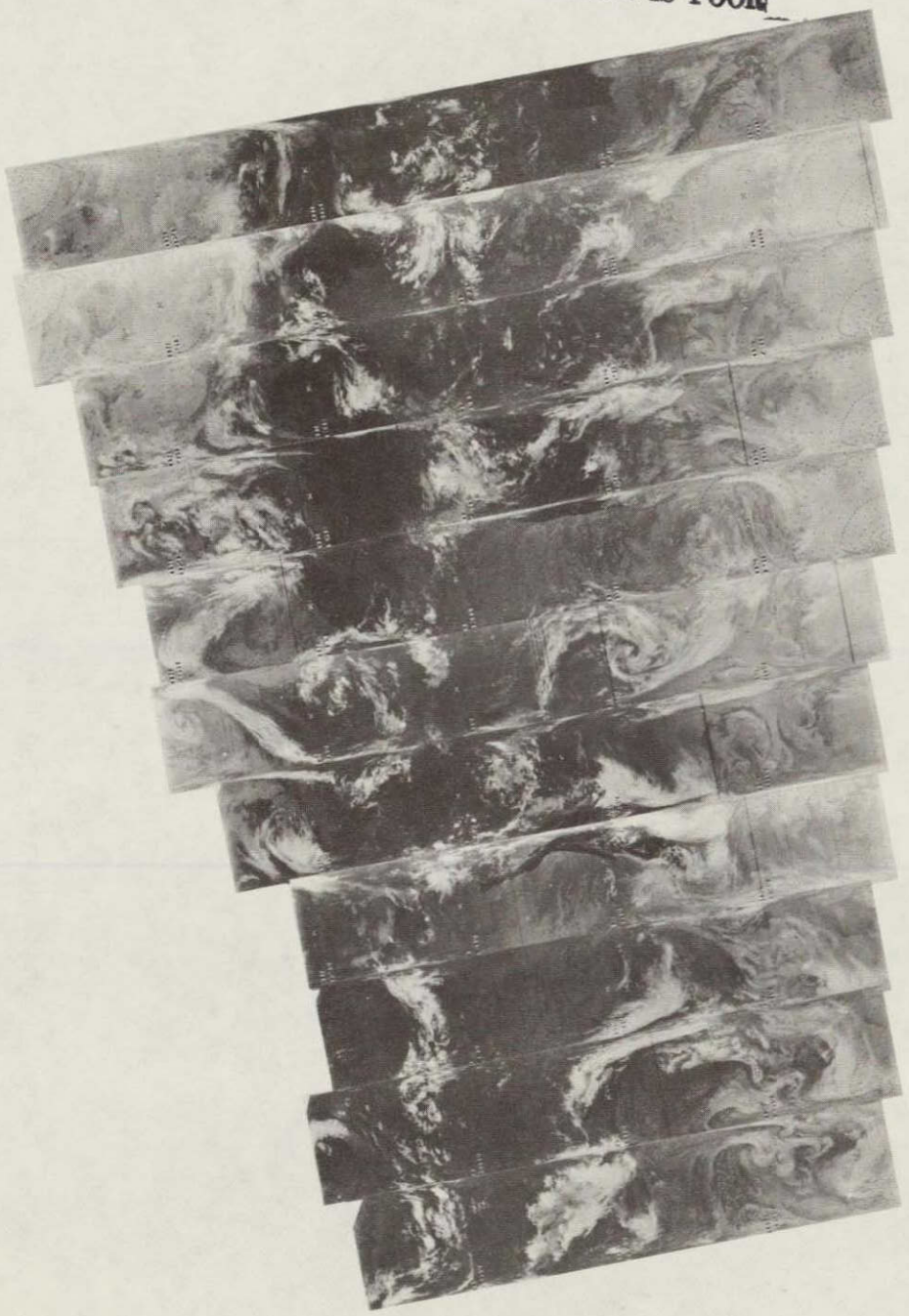


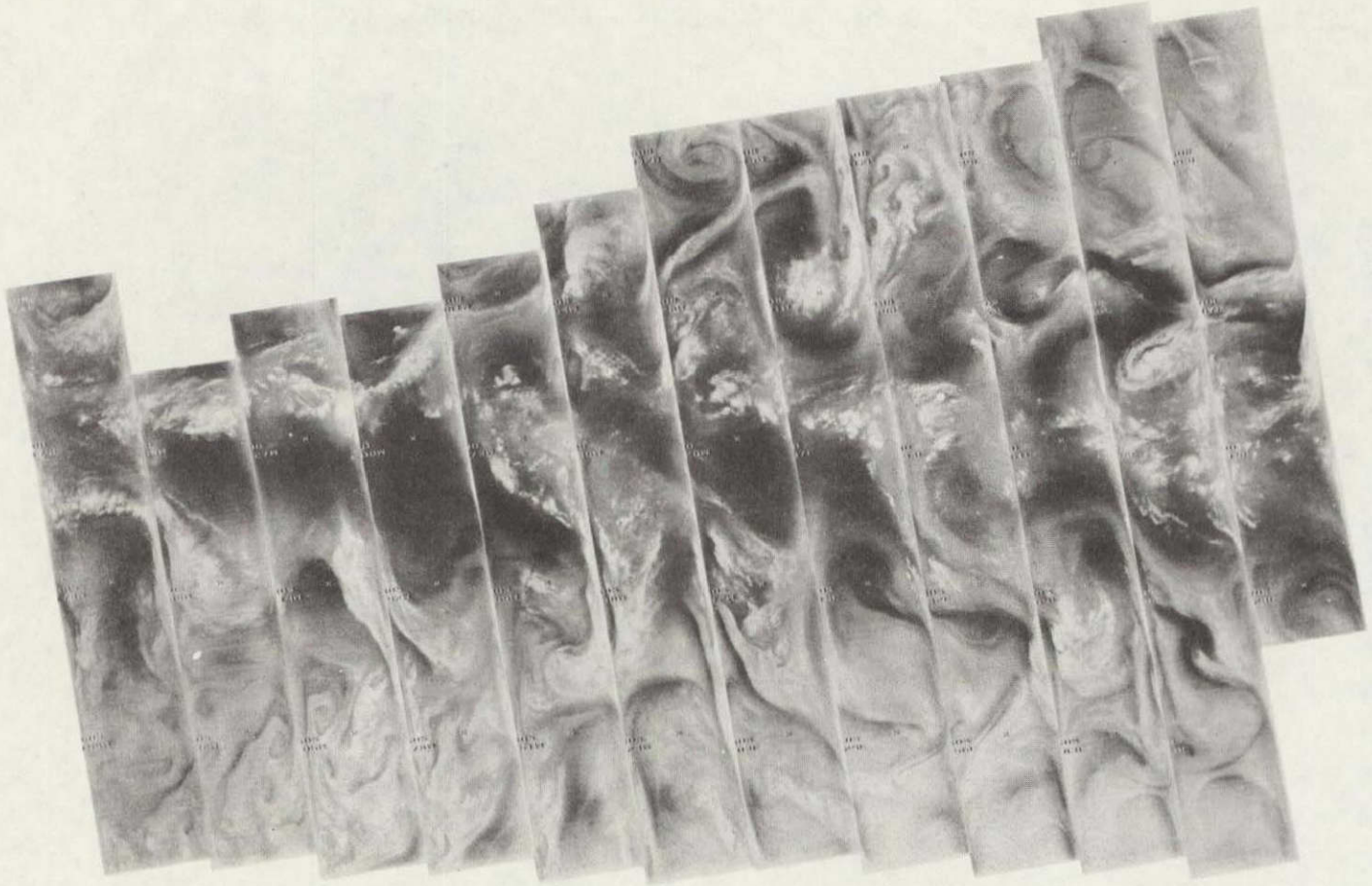
6842 6841 6840 6839 6838 6837 6836 6835 6834 6833 6832 6831 6830

3 NOV 76

6.7μm

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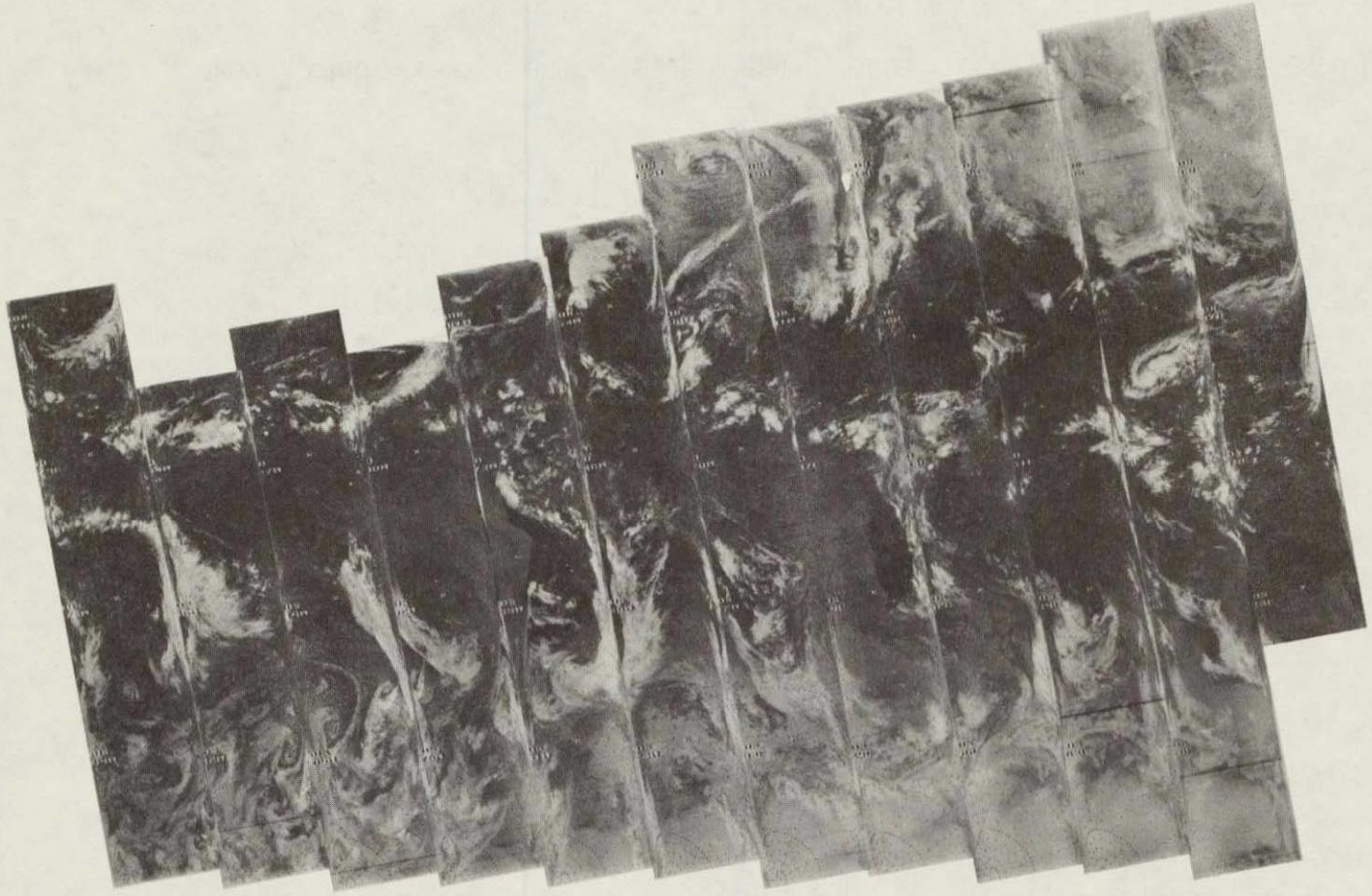




6856 6855 6854 6853 6852 6851 6850 6849 6848 6847 6846 6845 6844 6843

4 NOV 76

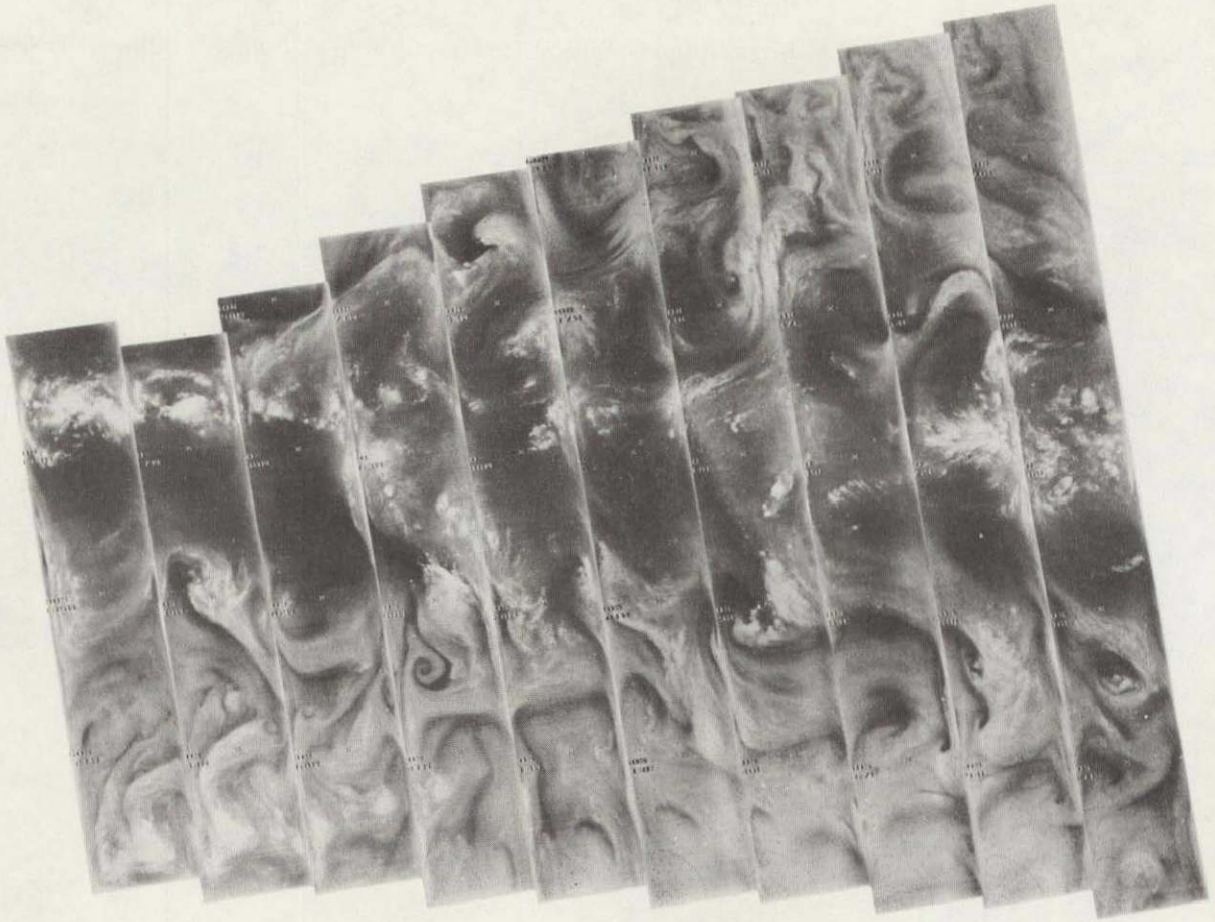
6.7μm



6856 6855 6854 6853 6852 6851 6850 6849 6848 6847 6846 6845 6844 6843

4 NOV 76

11.5μm

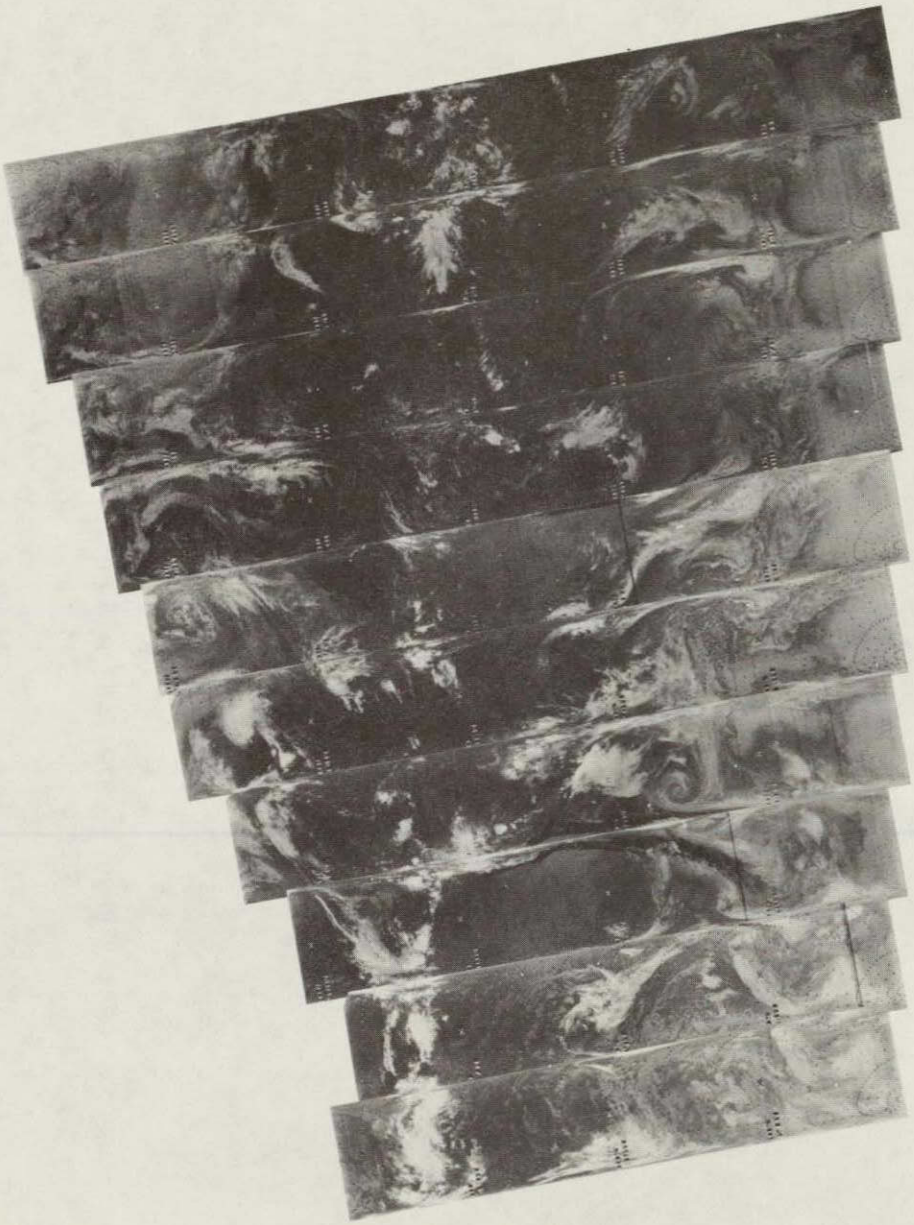


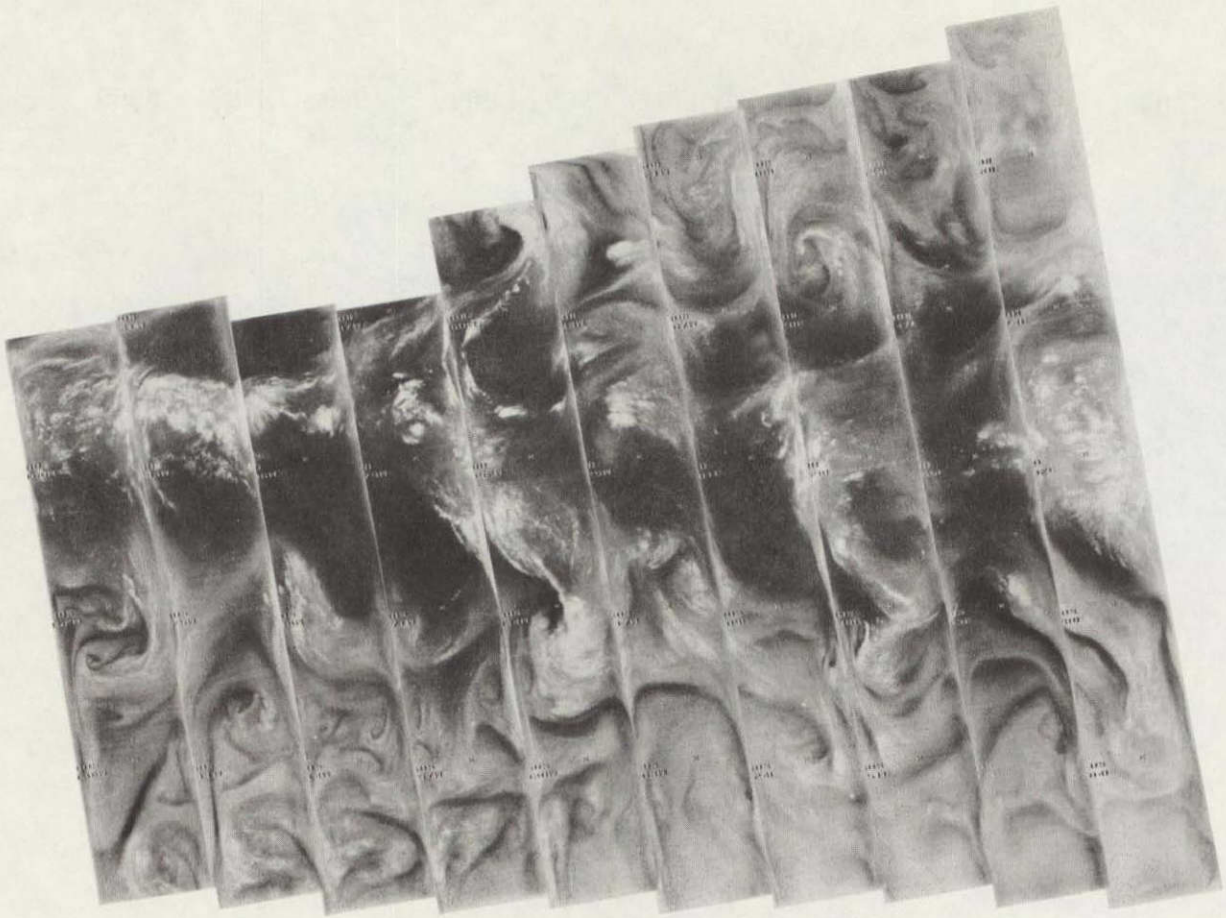
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5 NOV 76

6.7μm

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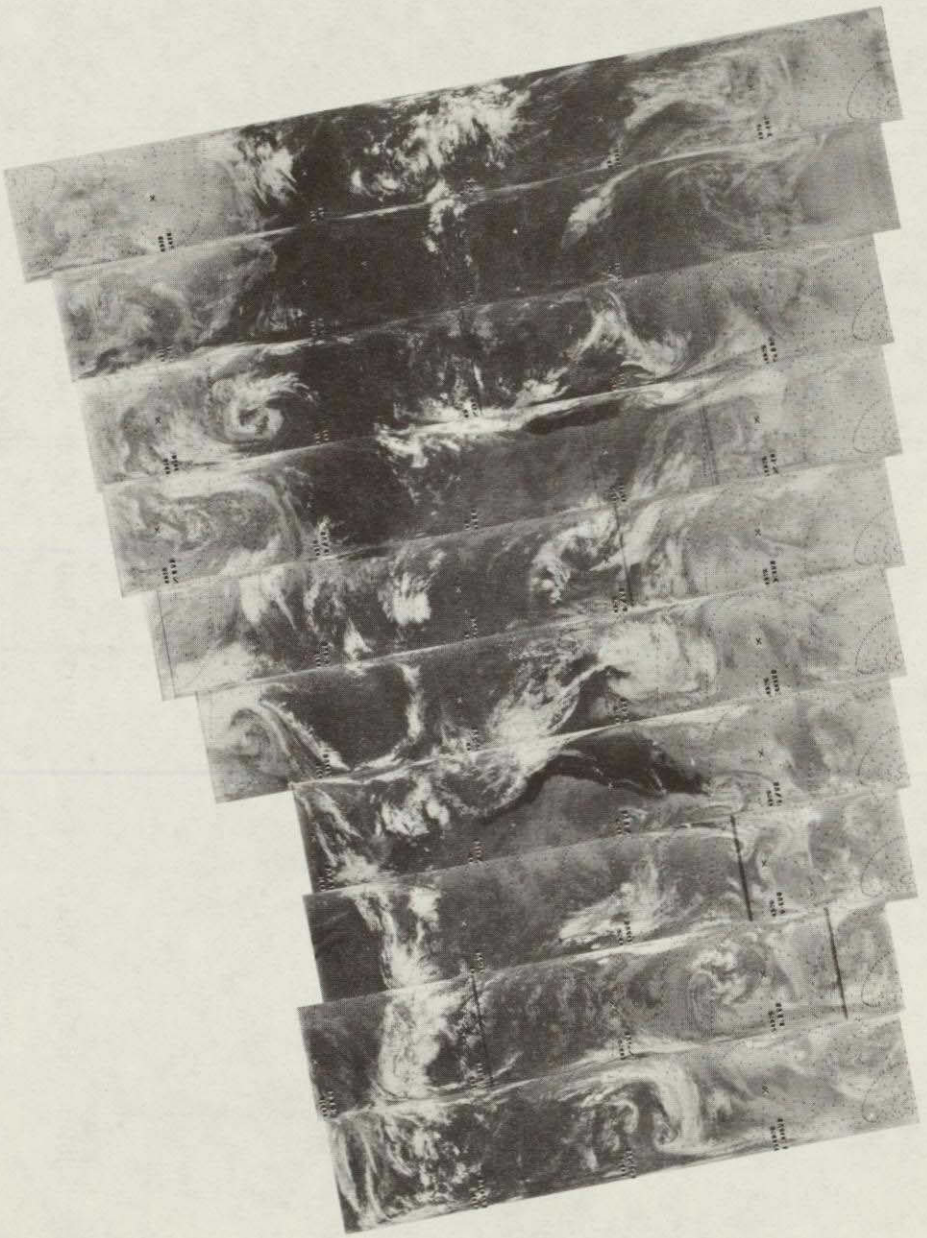


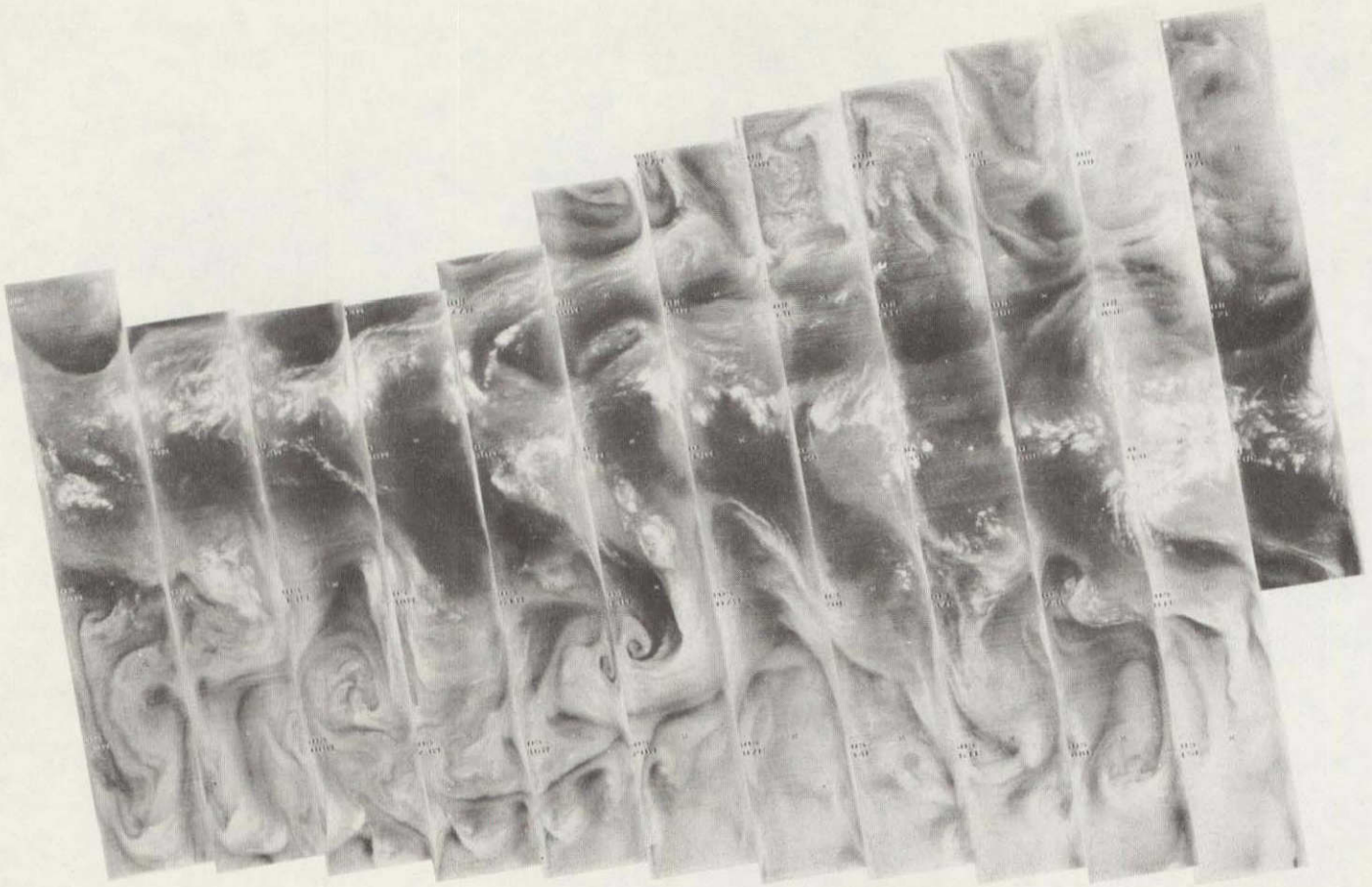
6882 6881 6880 6879 6878 6877 6876 6875 6874 6873 6872 6871 6870

6 NOV 76

6.7μm

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6896 6895 6894 6893 6892 6891 6890 6889 6888 6887 6886 6885 6884 6883

7 NOV 76

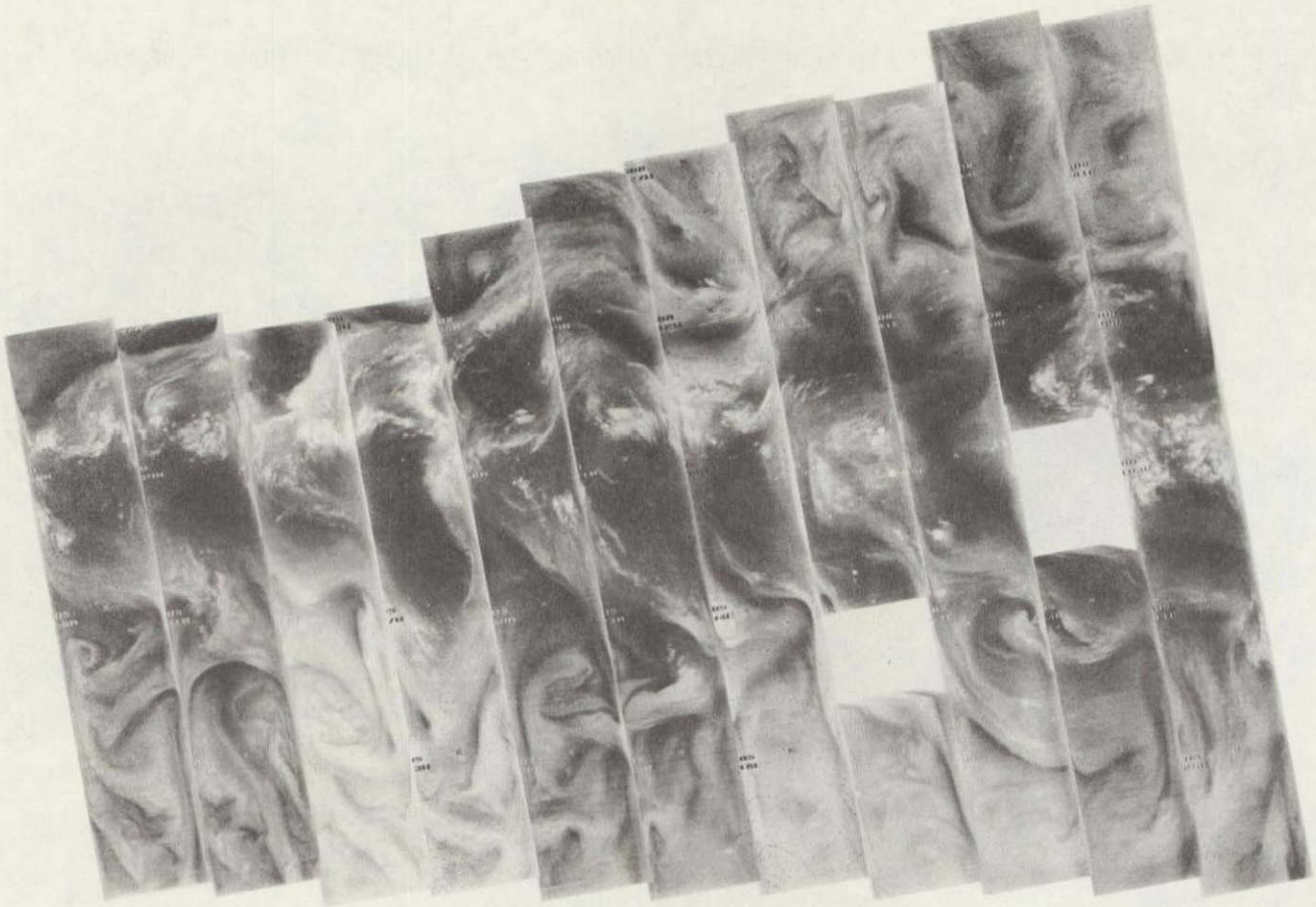
6.7μm

6896 6895 6894 6893 6892 6891 6890 6889 6888 6887 6886 6885 6884 6883

7 NOV 76

11.5μm

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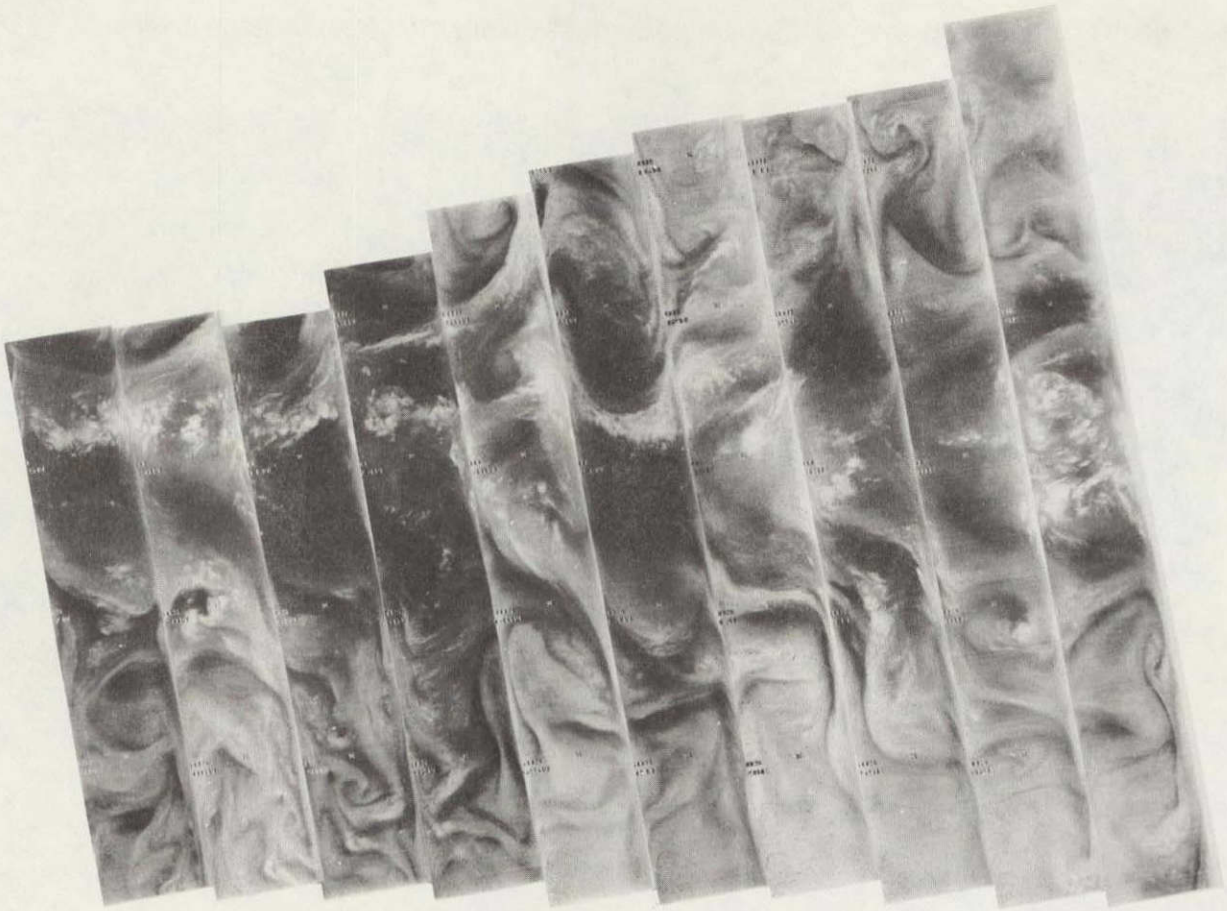
8 NOV 76

6.7μm

6909 6908 6907 6906 6905 6904 6903 6902 6901 6900 6899 6898 6897

8 NOV 76

11.5μm



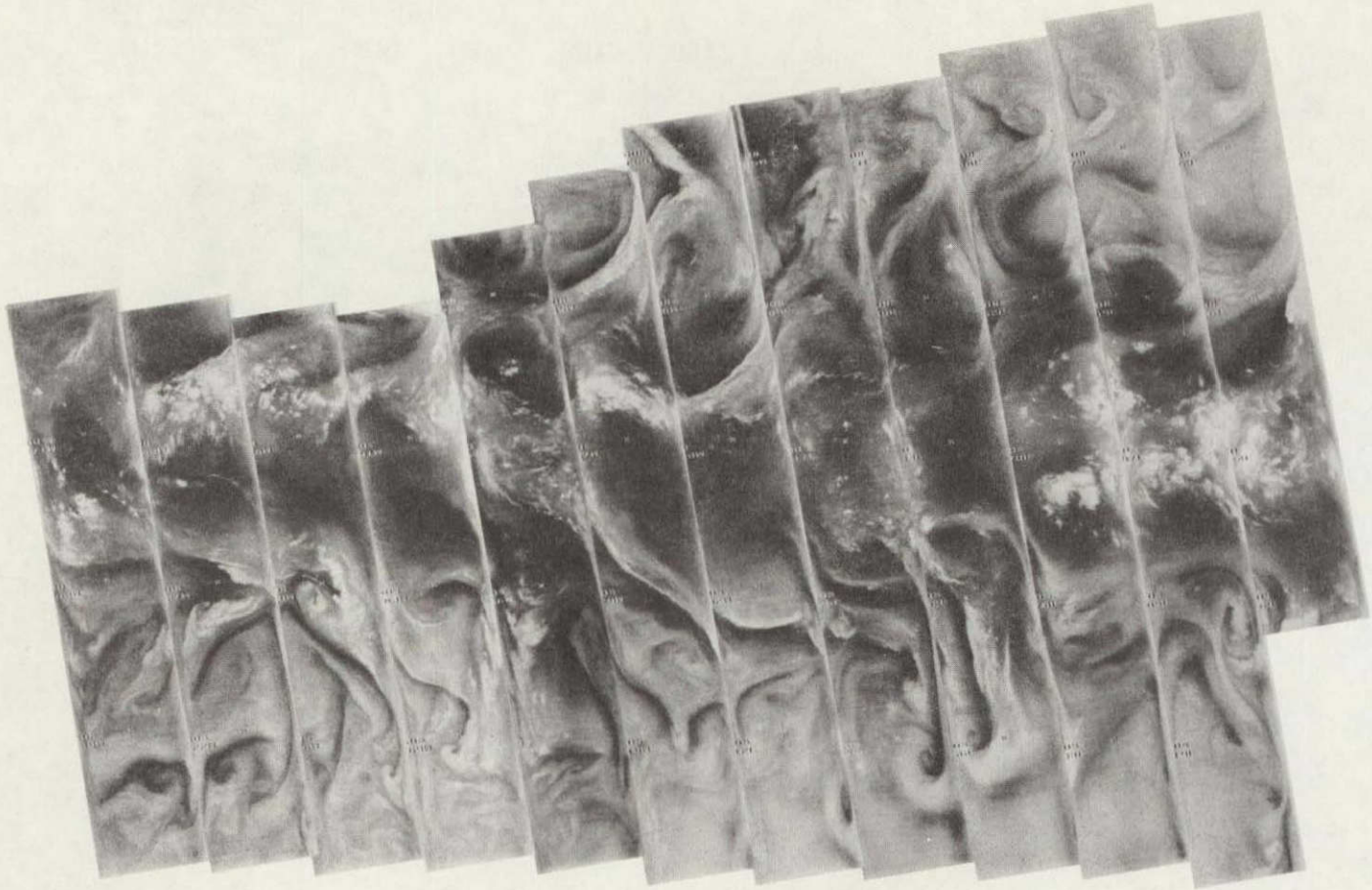
6923 6922 6921 6920 6919 6918 6917 6916 6915 6914 6913 6912 6911 6910

9 NOV 76

6.7μm

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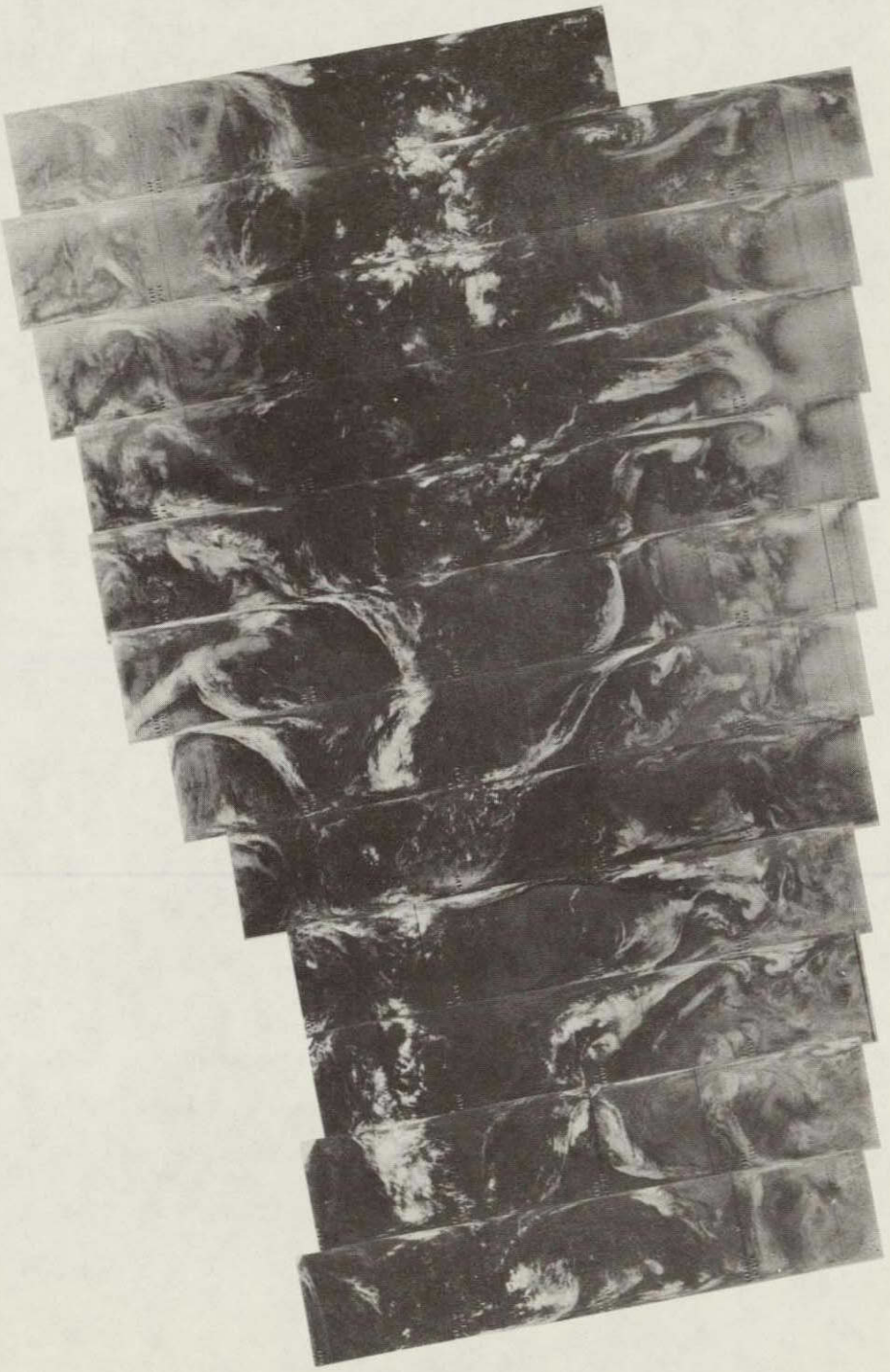


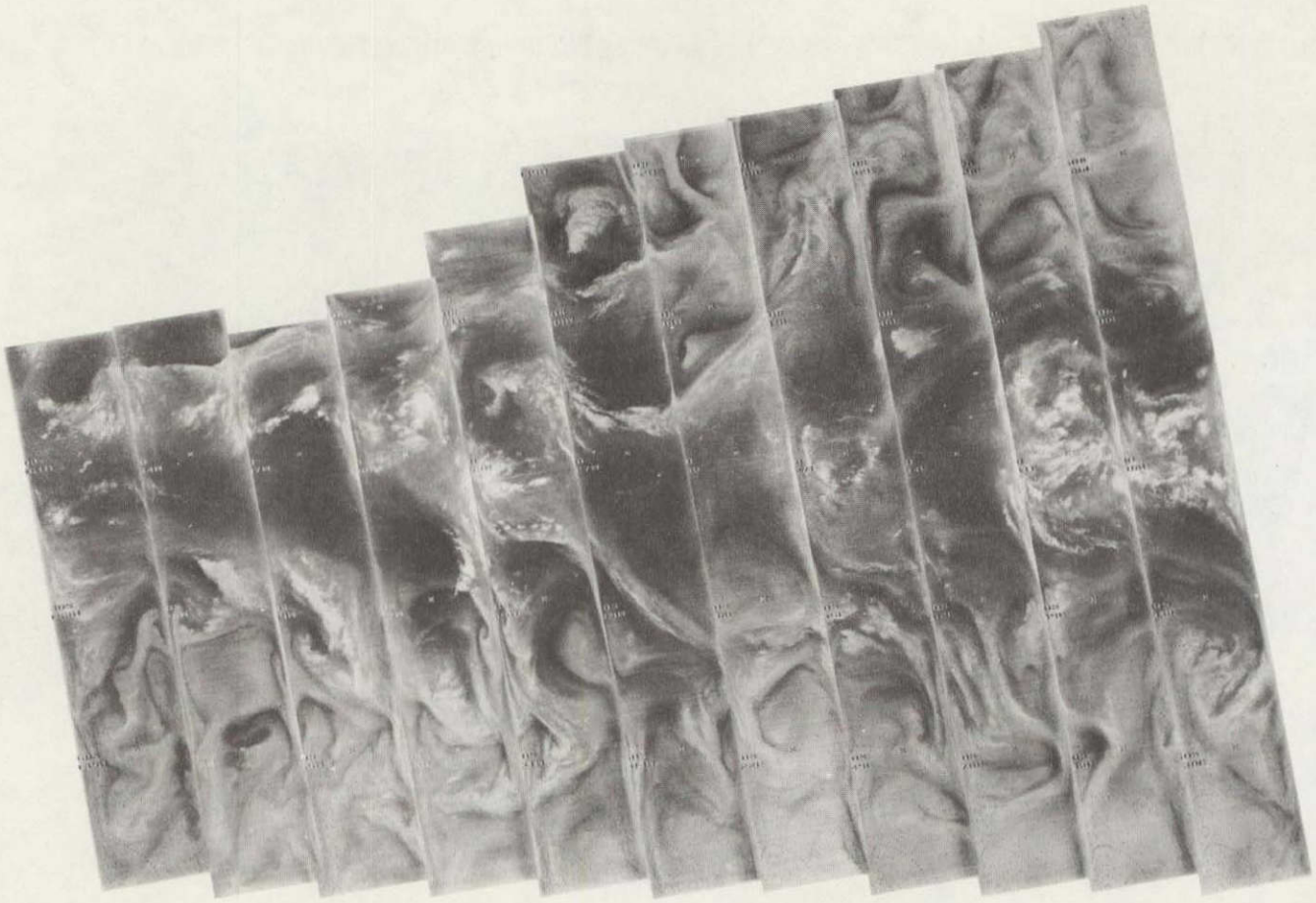
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10 NOV 76

6.7μm

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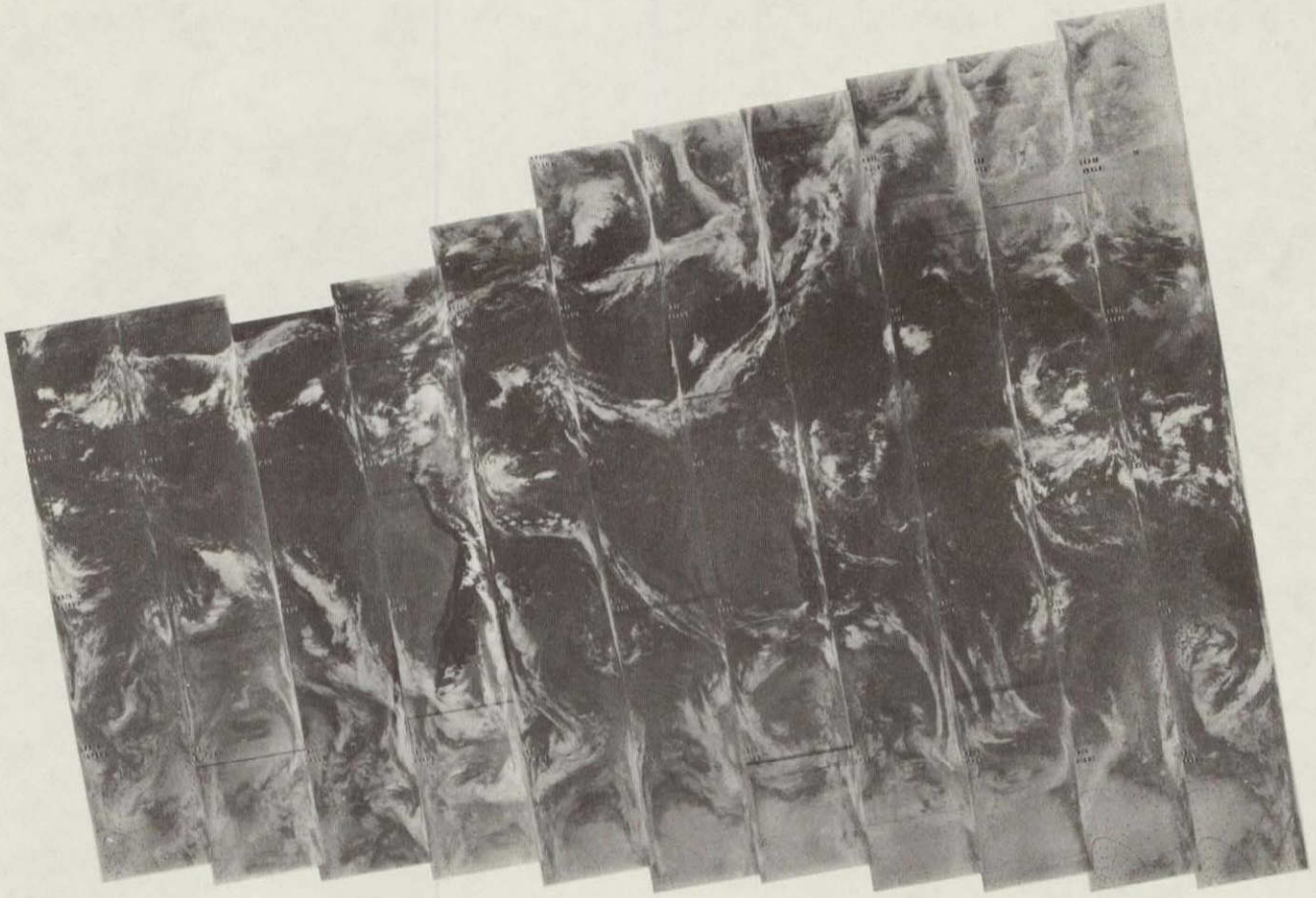




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11 NOV 76

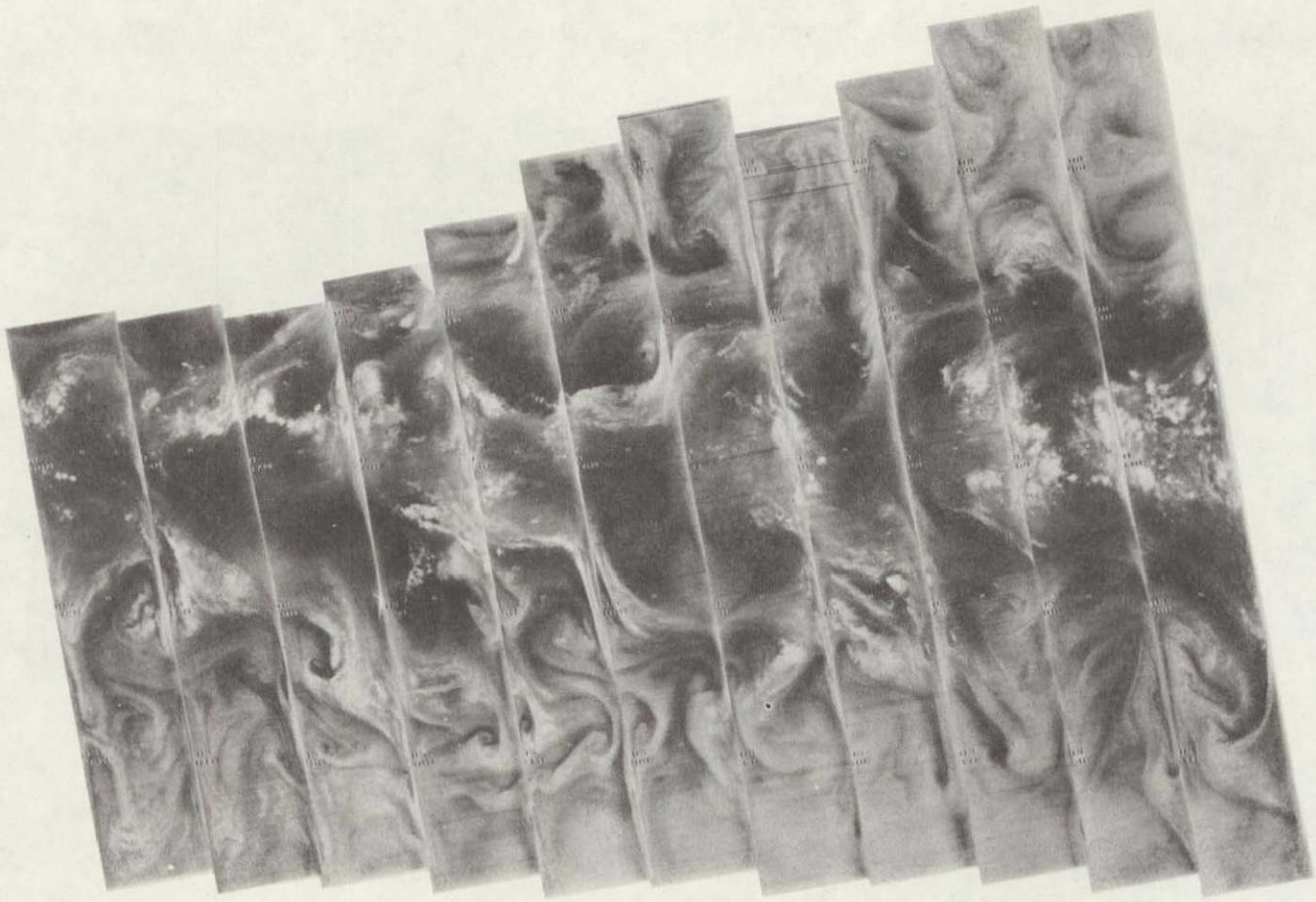
6.7μm



6949 6948 6947 6946 6945 6944 6943 6942 6941 6940 6939 6938 6937

11 NOV 76

11.5μm

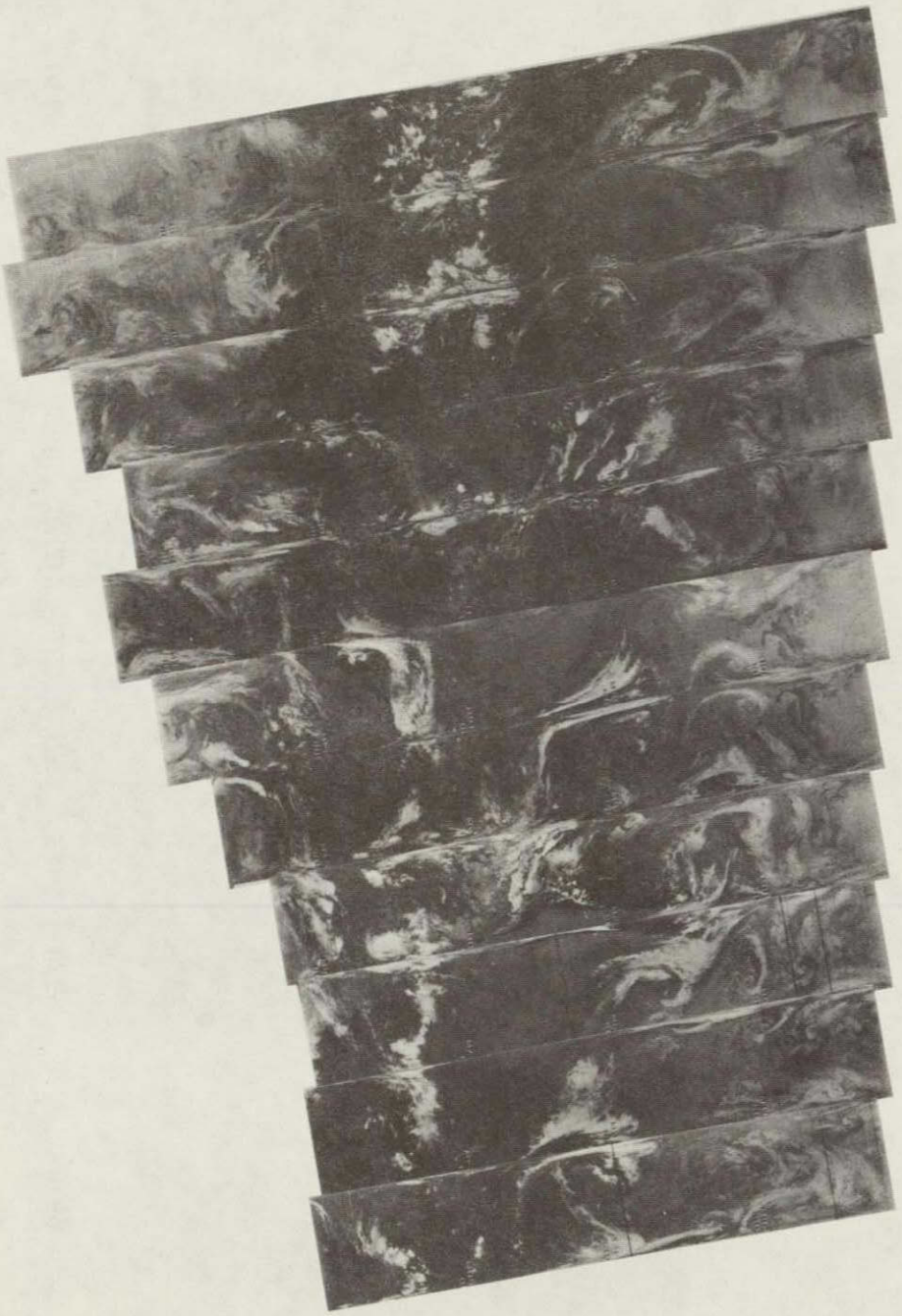


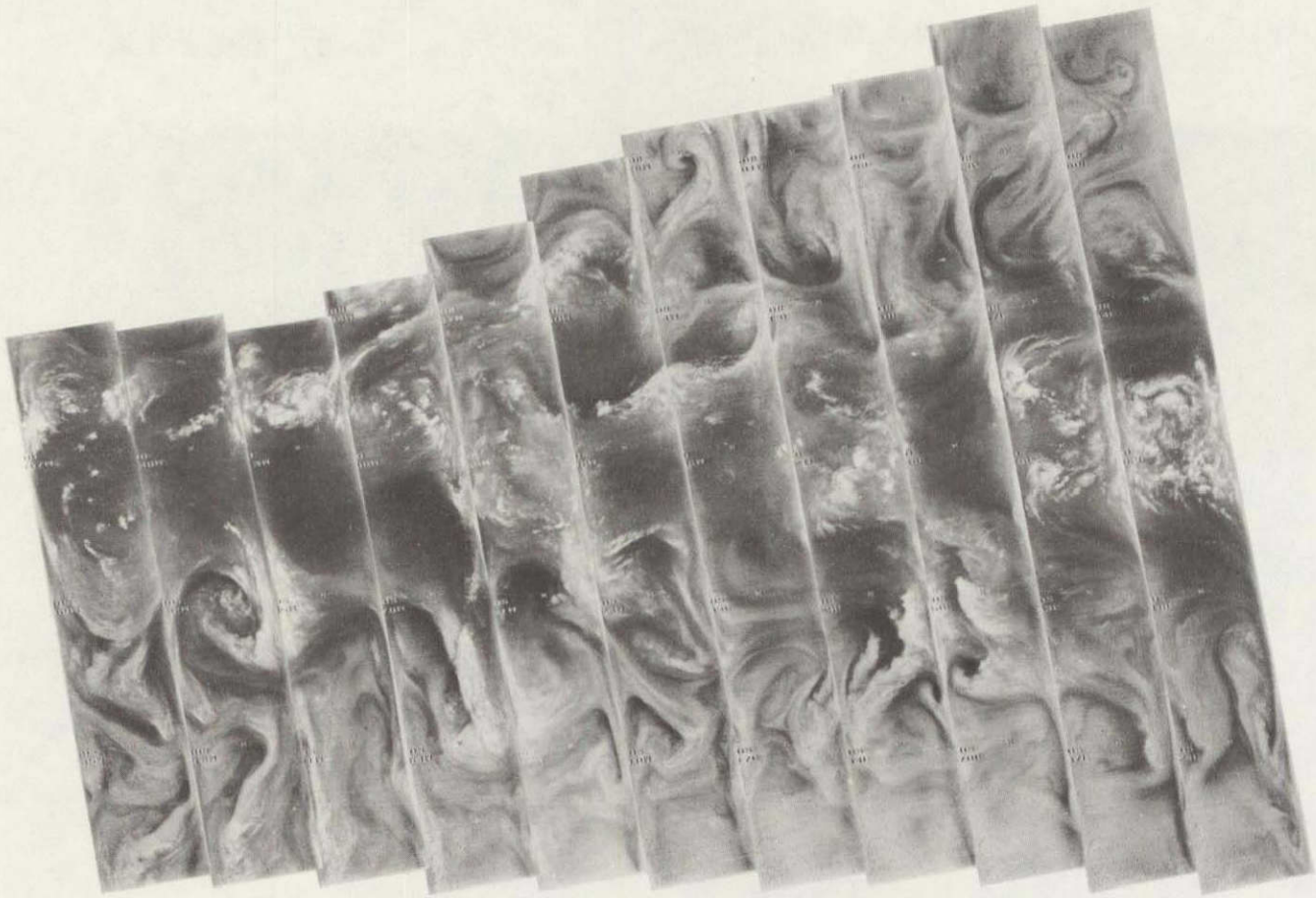
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12 NOV 76

6.7μm

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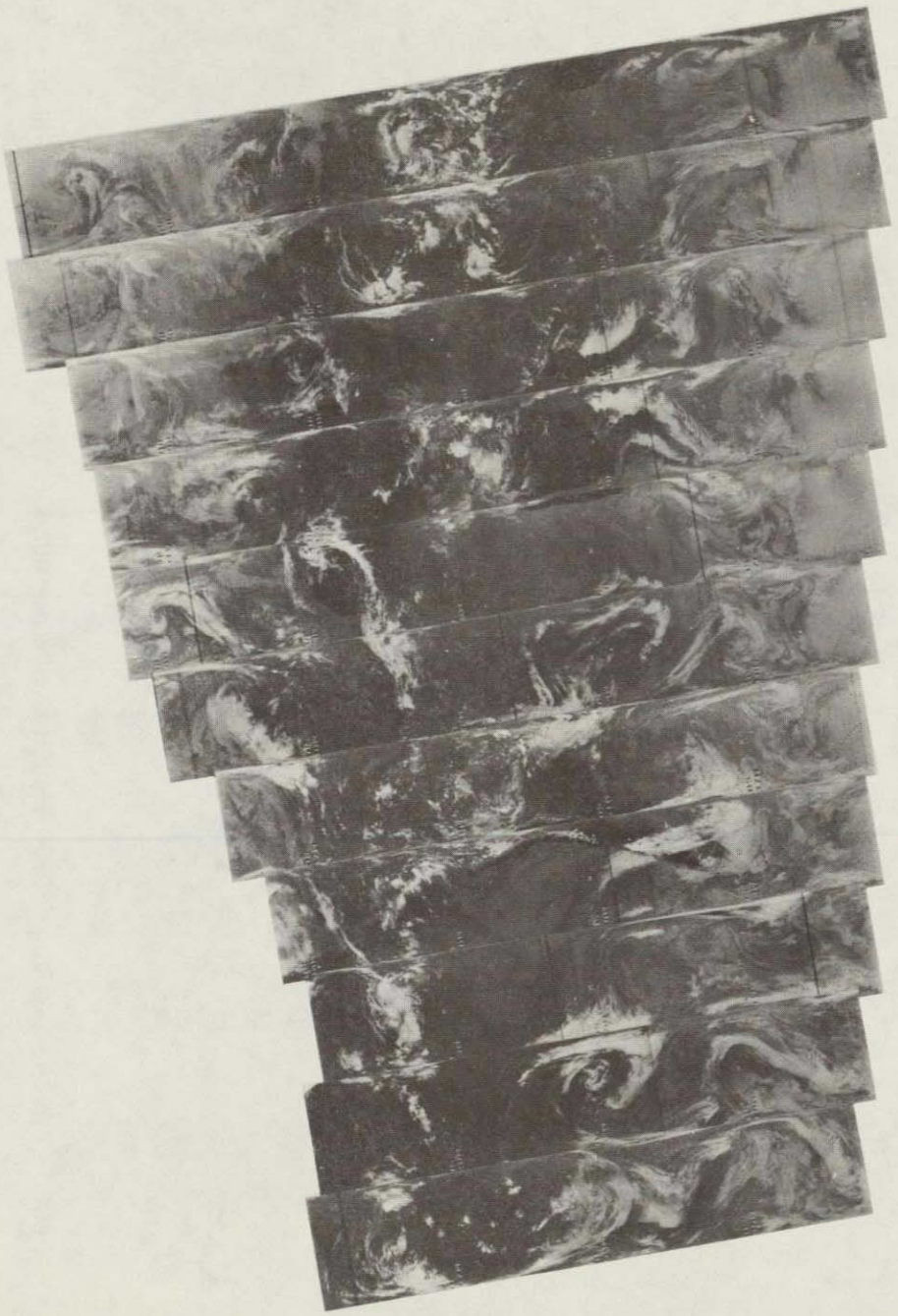


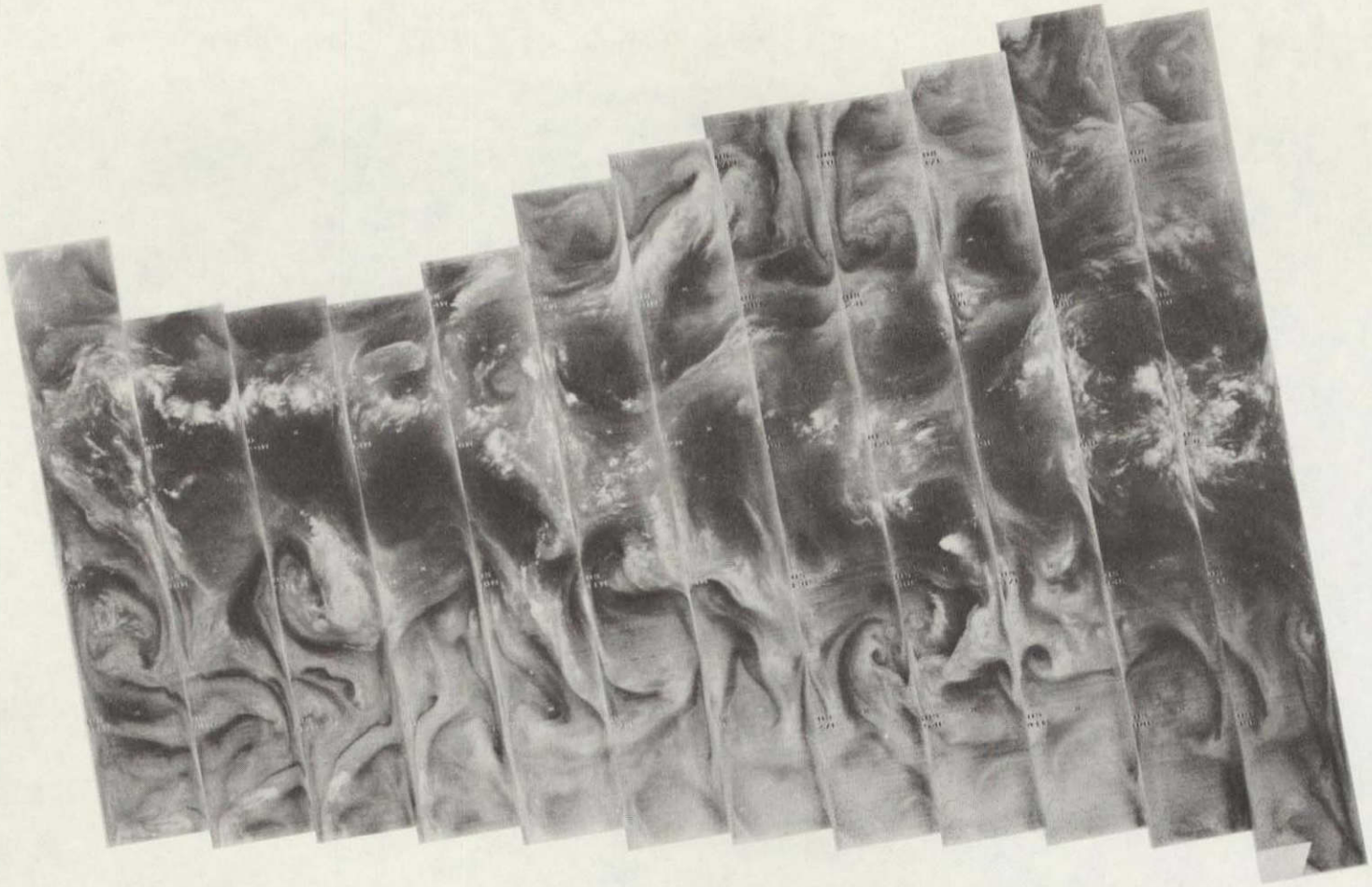
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6.7μm

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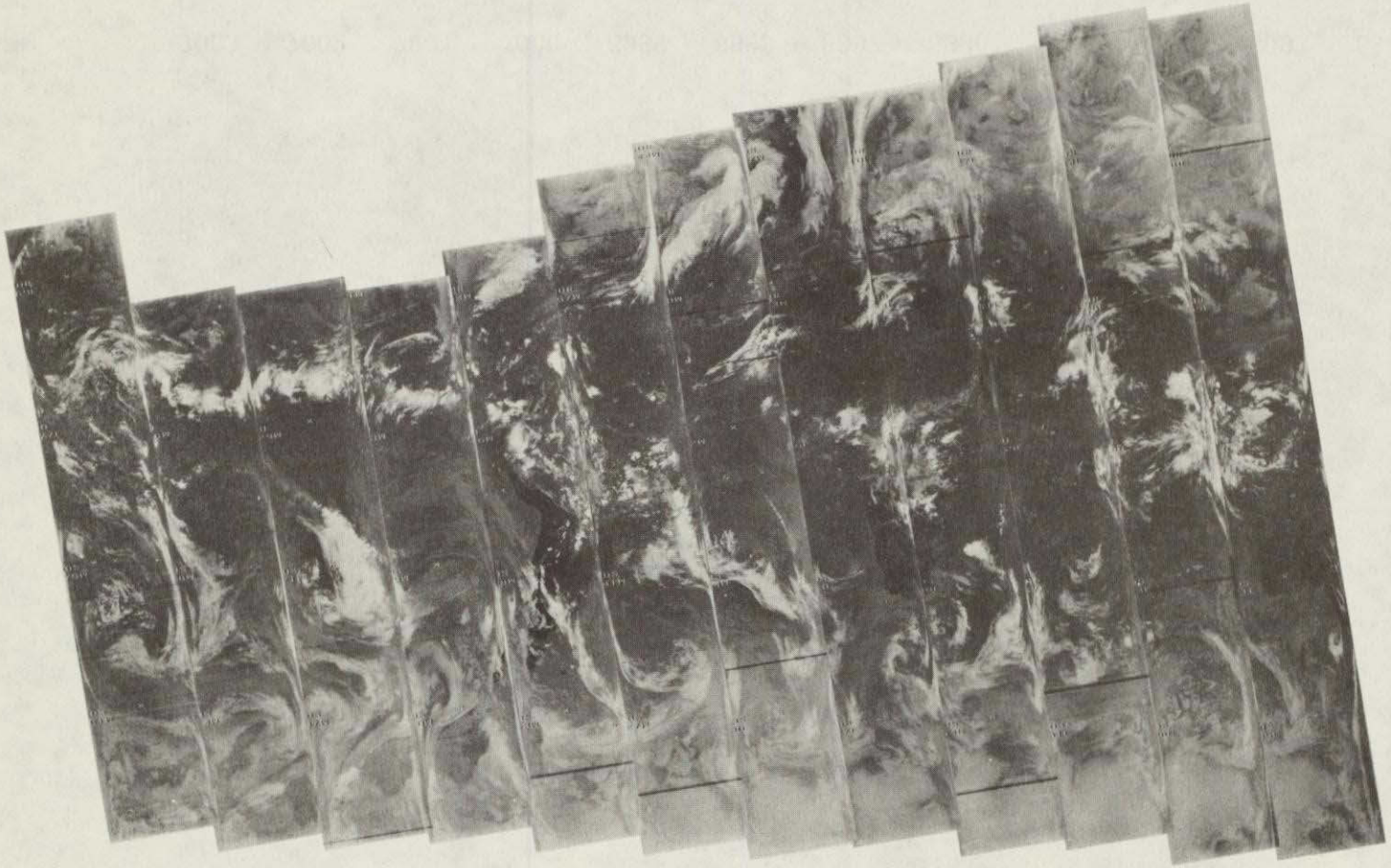




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14 NOV 76

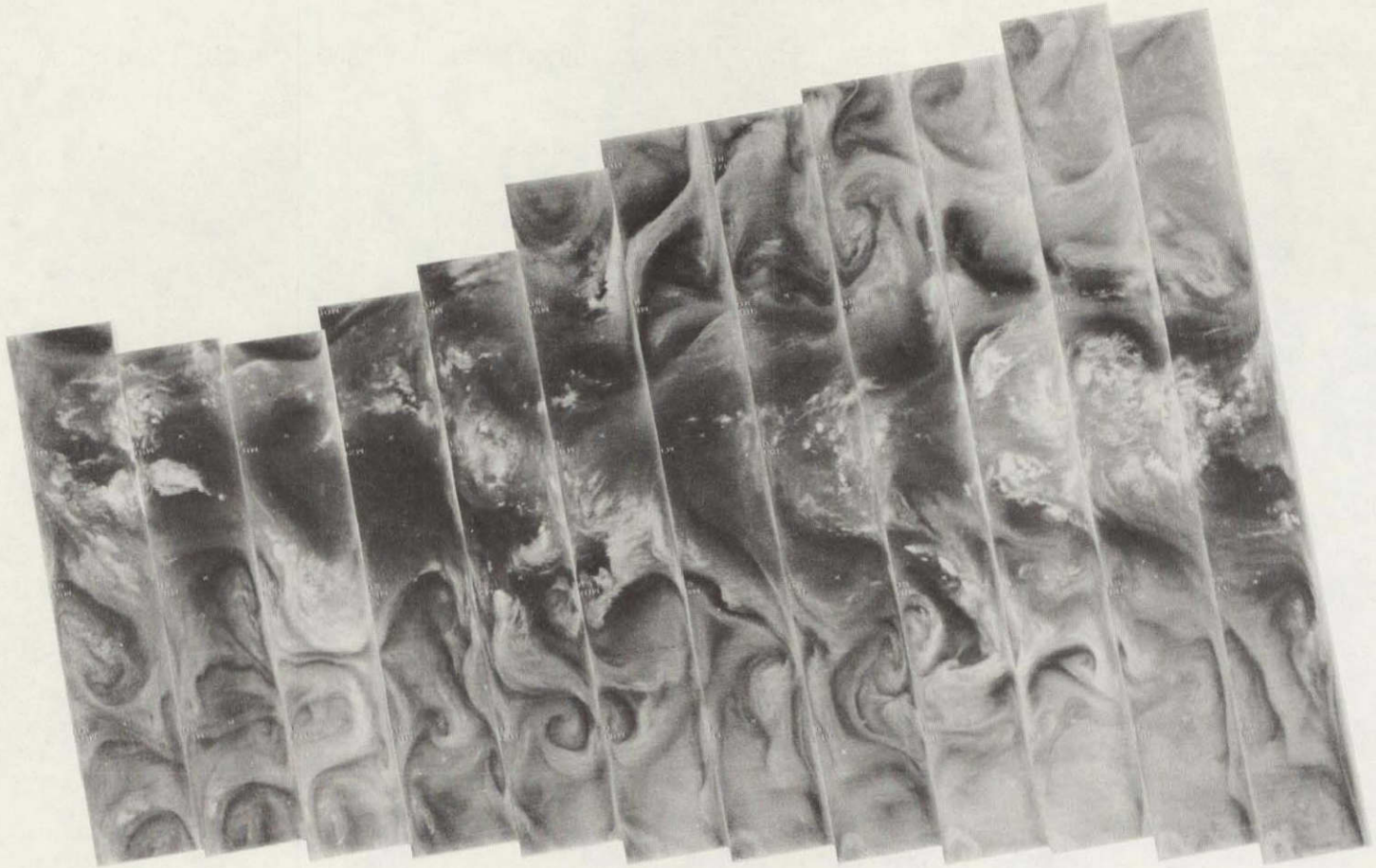
6.7μm



6990 6989 6988 6987 6986 6985 6984 6983 6982 6981 6980 6979 6978 6977

14 NOV 76

11.5μm

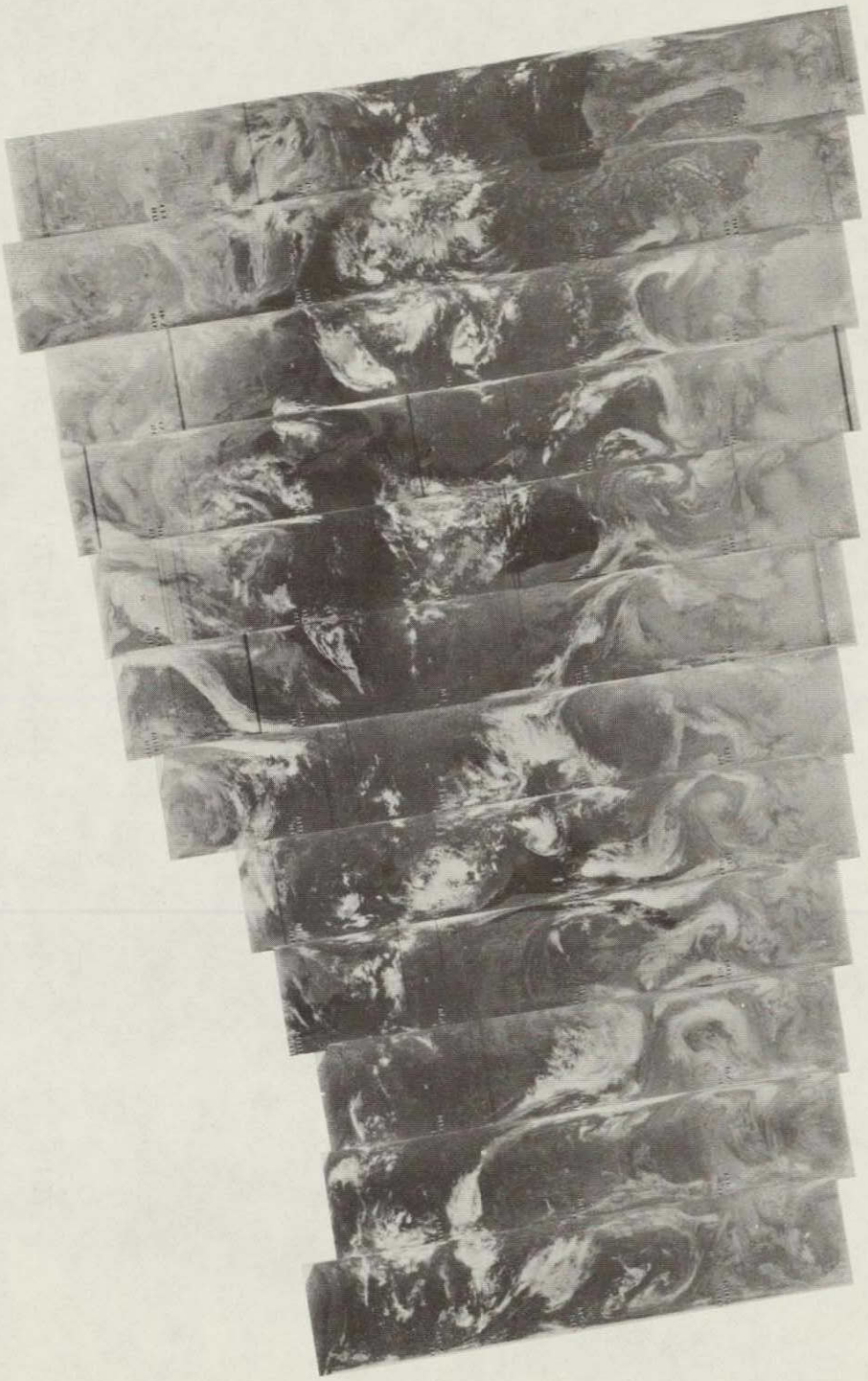


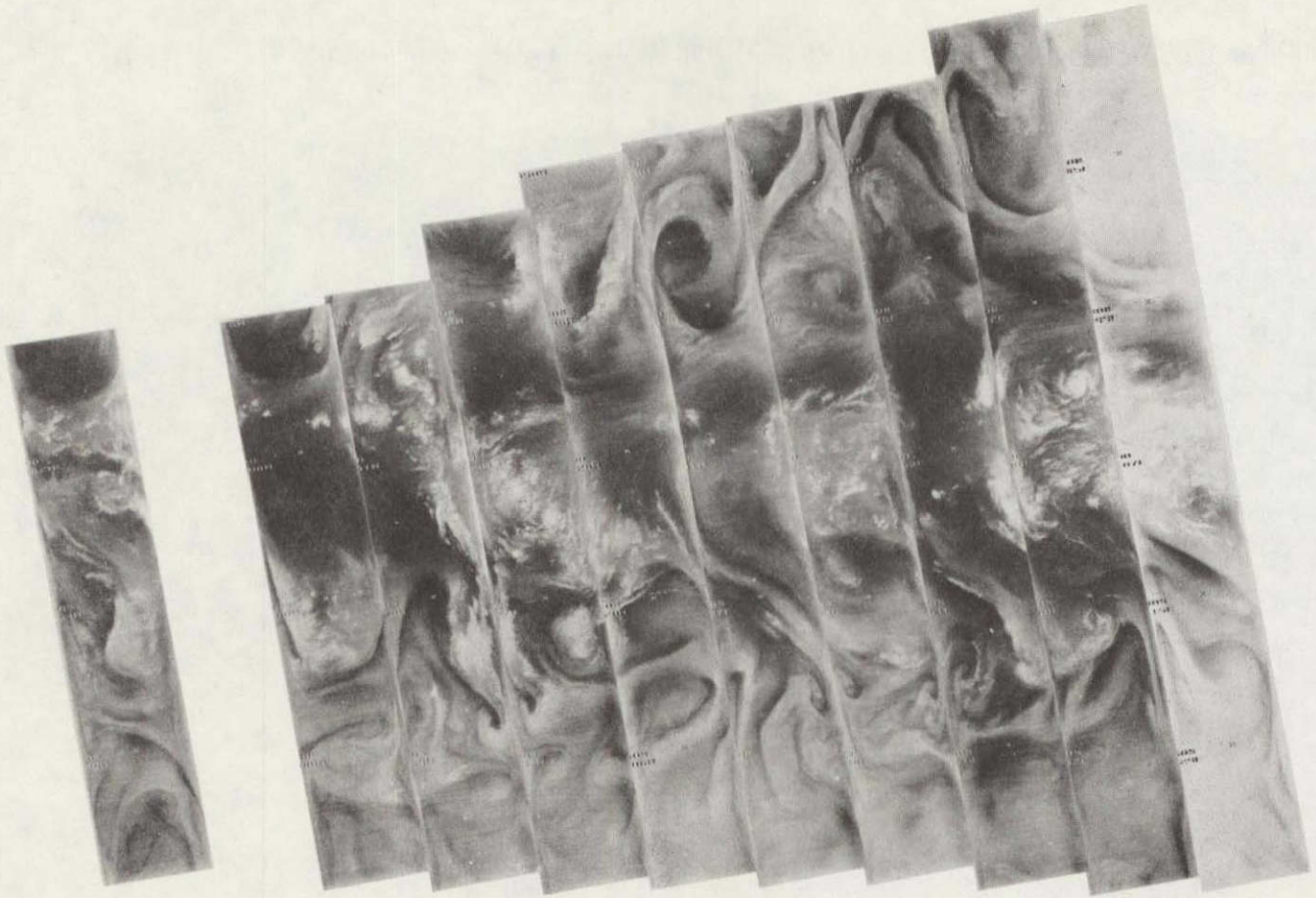
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15 NOV 76

6.7μm

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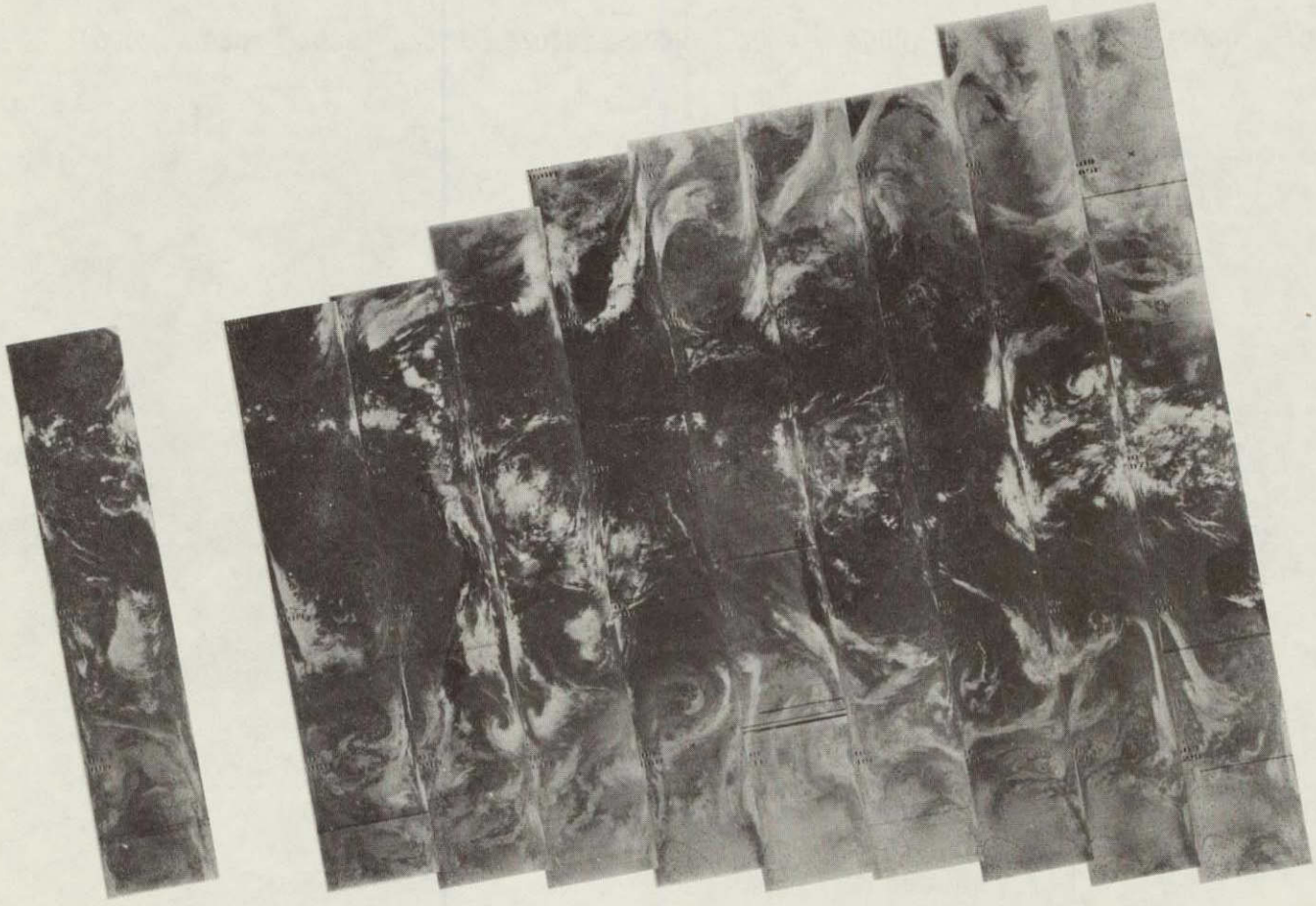




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16 NOV 76

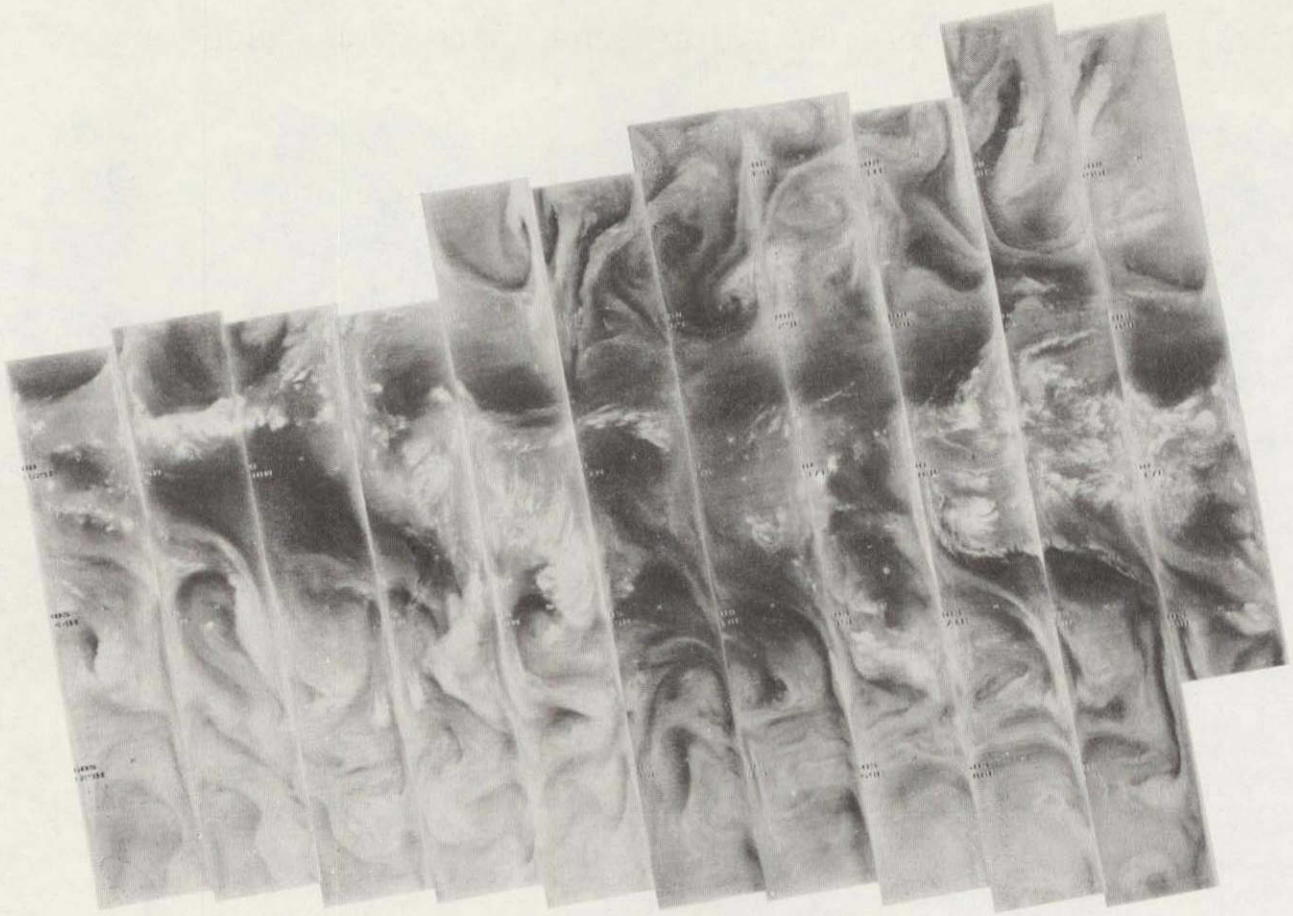
6.7μm



7016 7015 7014 7013 7012 7011 7010 7009 7008 7007 7006 7005 7004

16 NOV 76

11.5μm

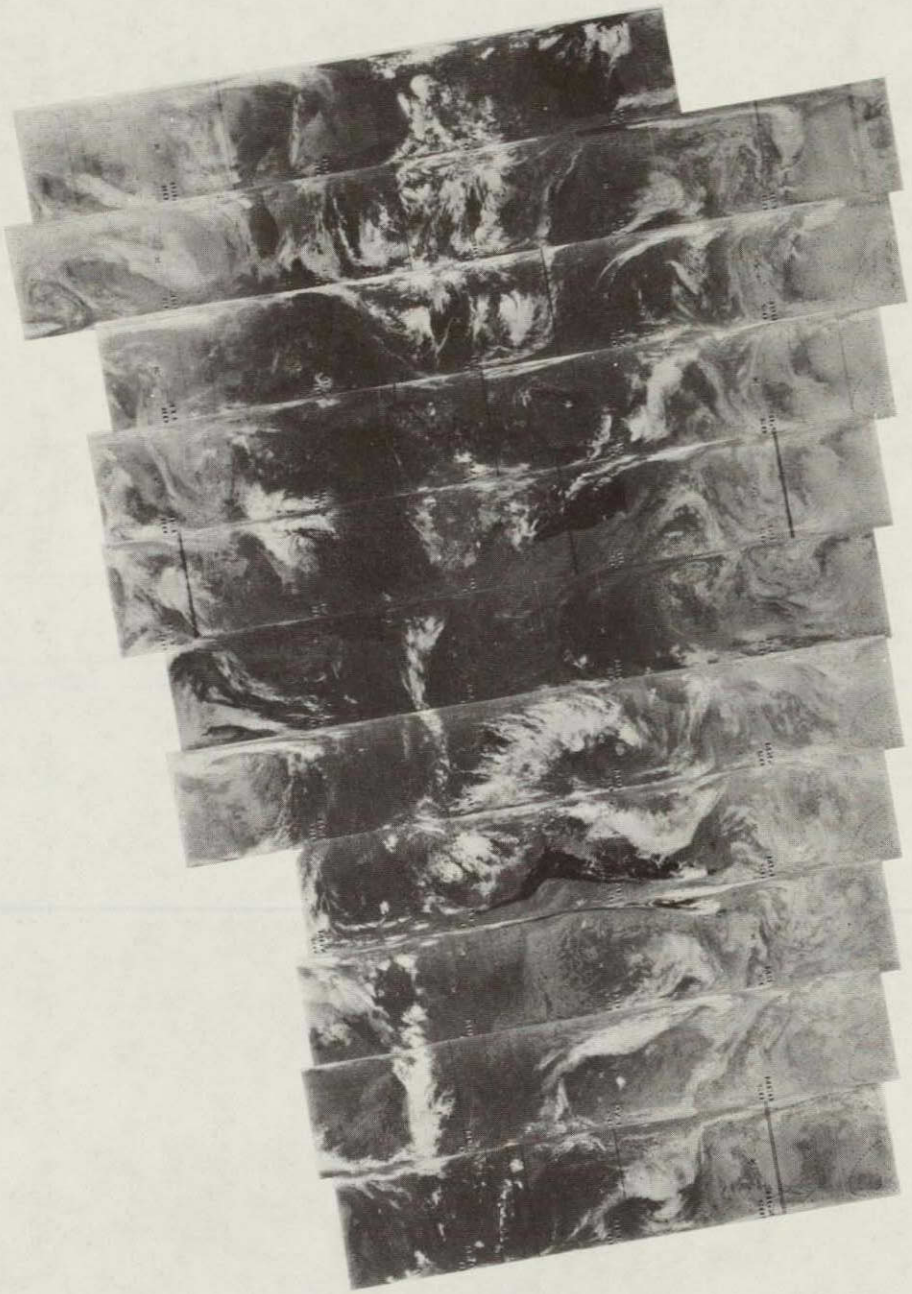


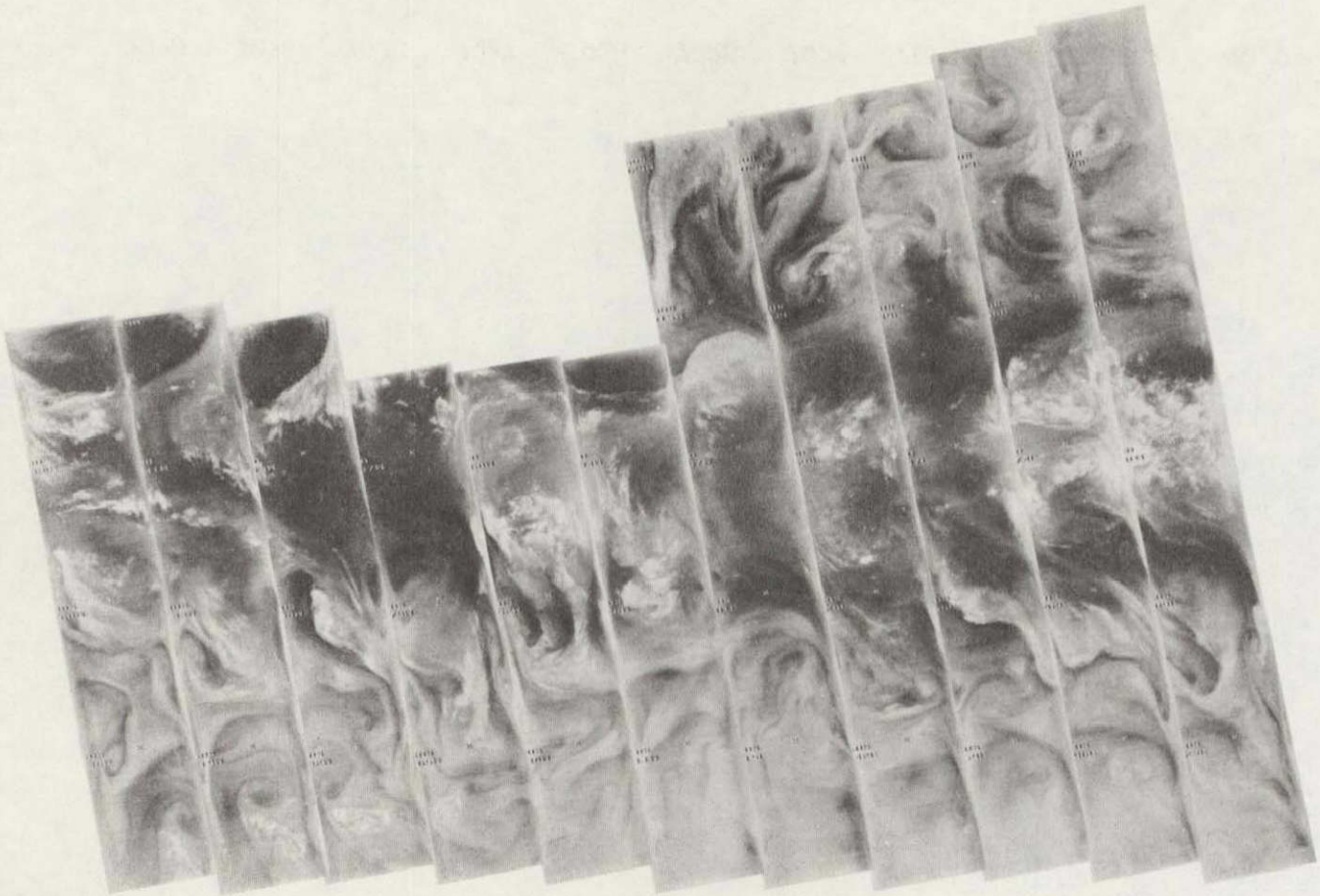
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17 NOV 76

6.7μm

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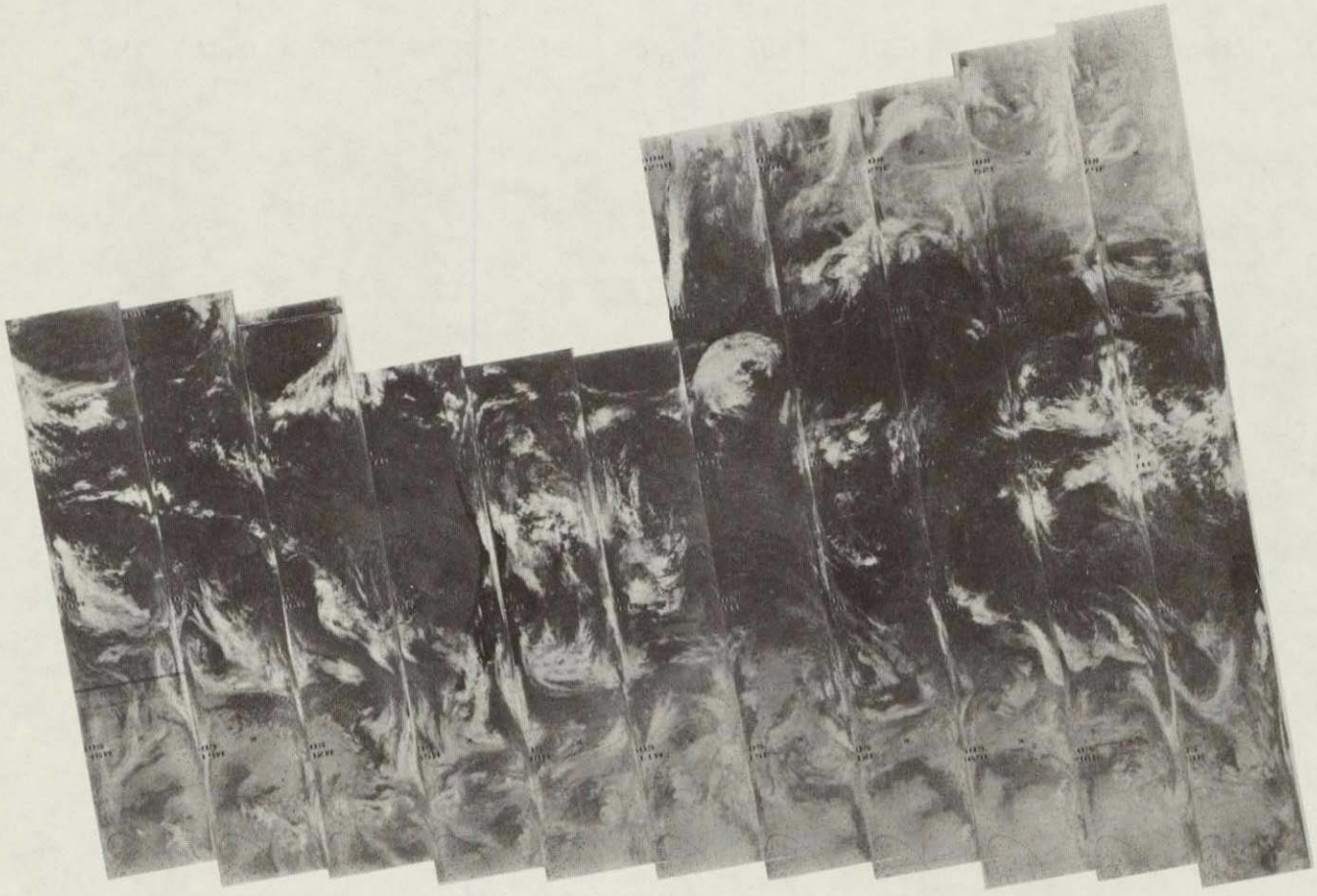




7043 7042 7041 7040 7039 7038 7037 7036 7035 7034 7033 7032 7031

18 NOV 76

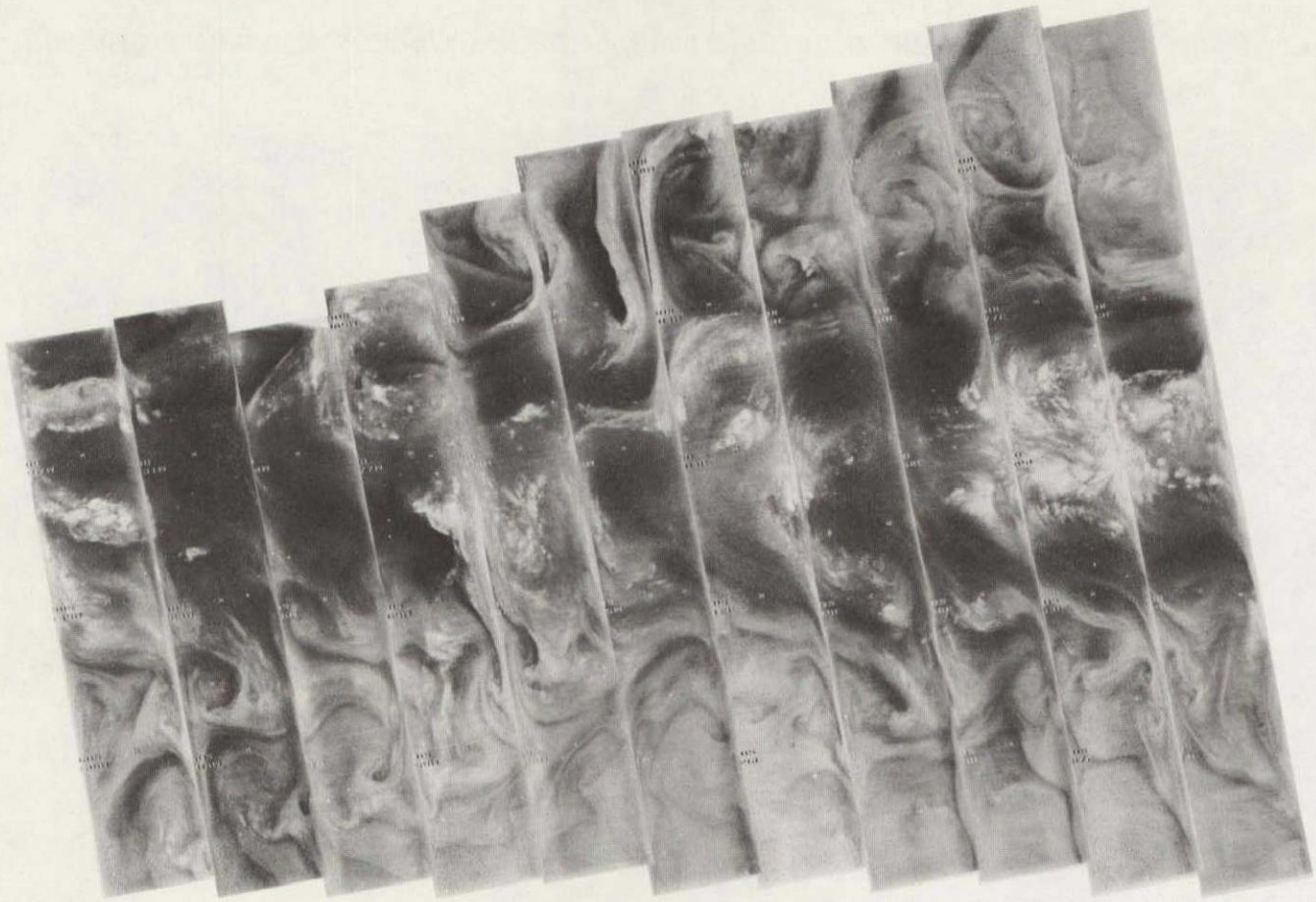
6.7μm



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18 NOV 76

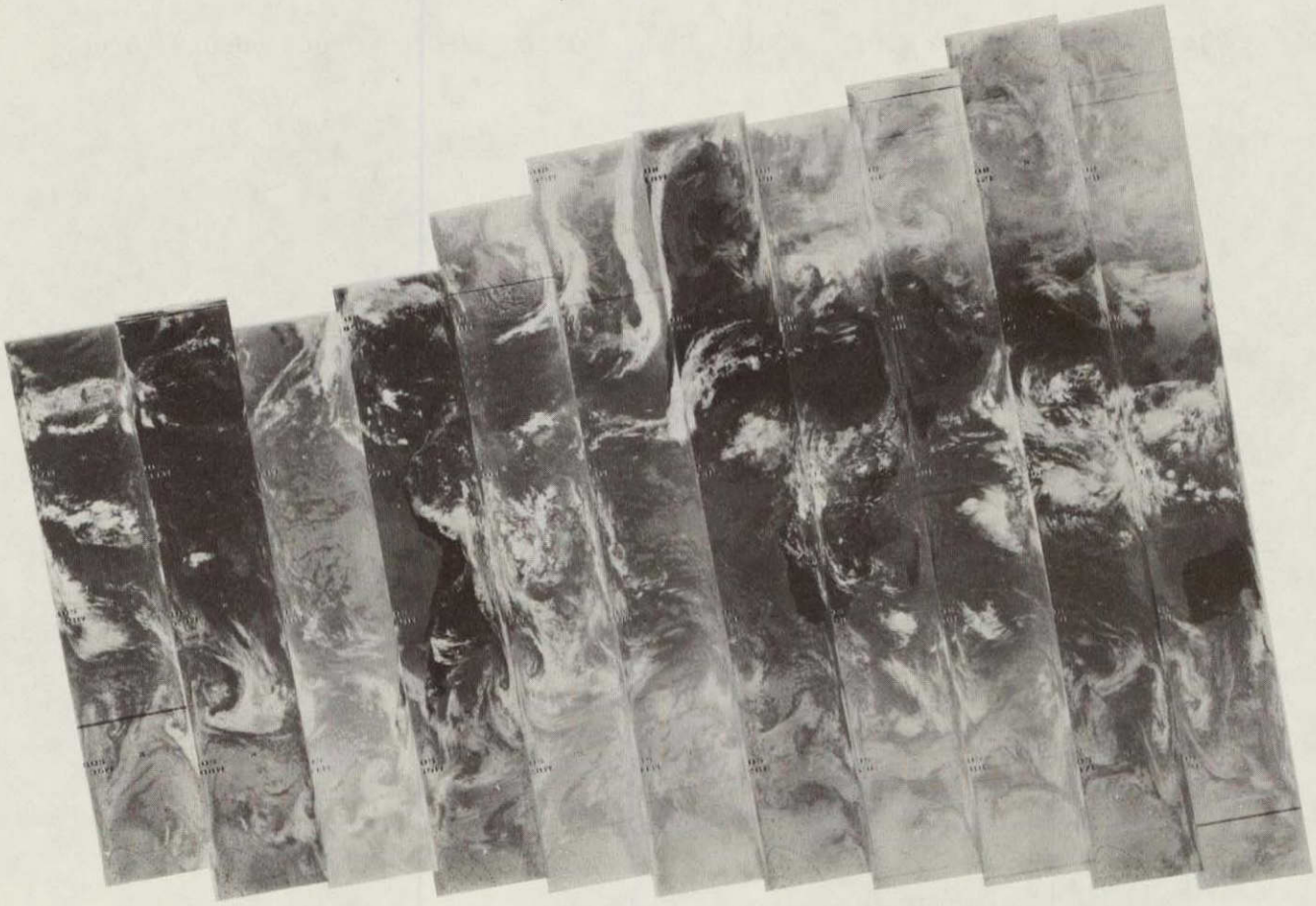
11.5μm



7057 7056 7055 7054 7053 7052 7051 7050 7049 7048 7047 7046 7045 7044

19 NOV 76

6.7μm



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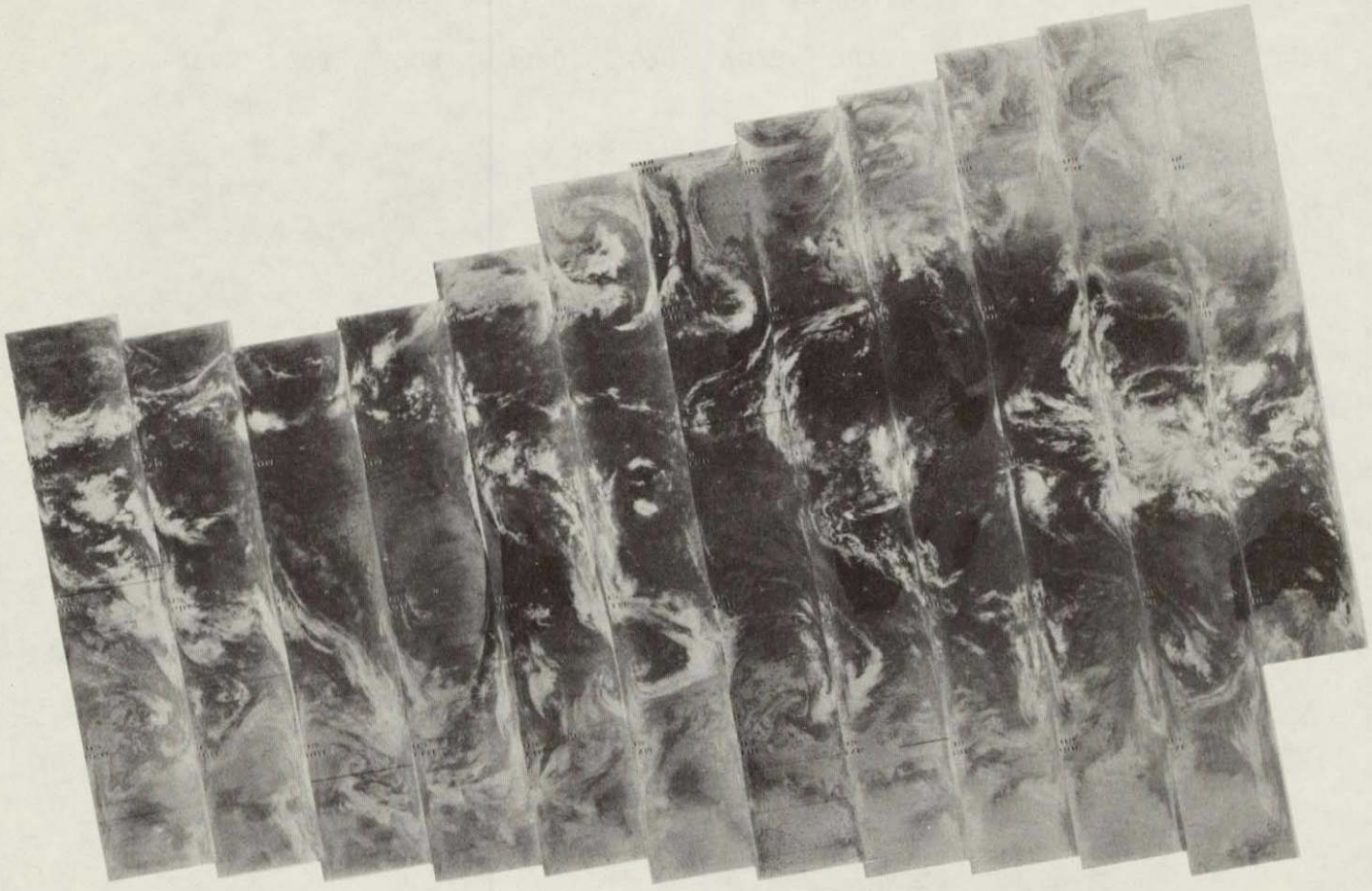
19 NOV 76

11.5μm

7070 7069 7068 7067 7066 7065 7064 7063 7062 7061 7060 7059 7058

20 NOV 76

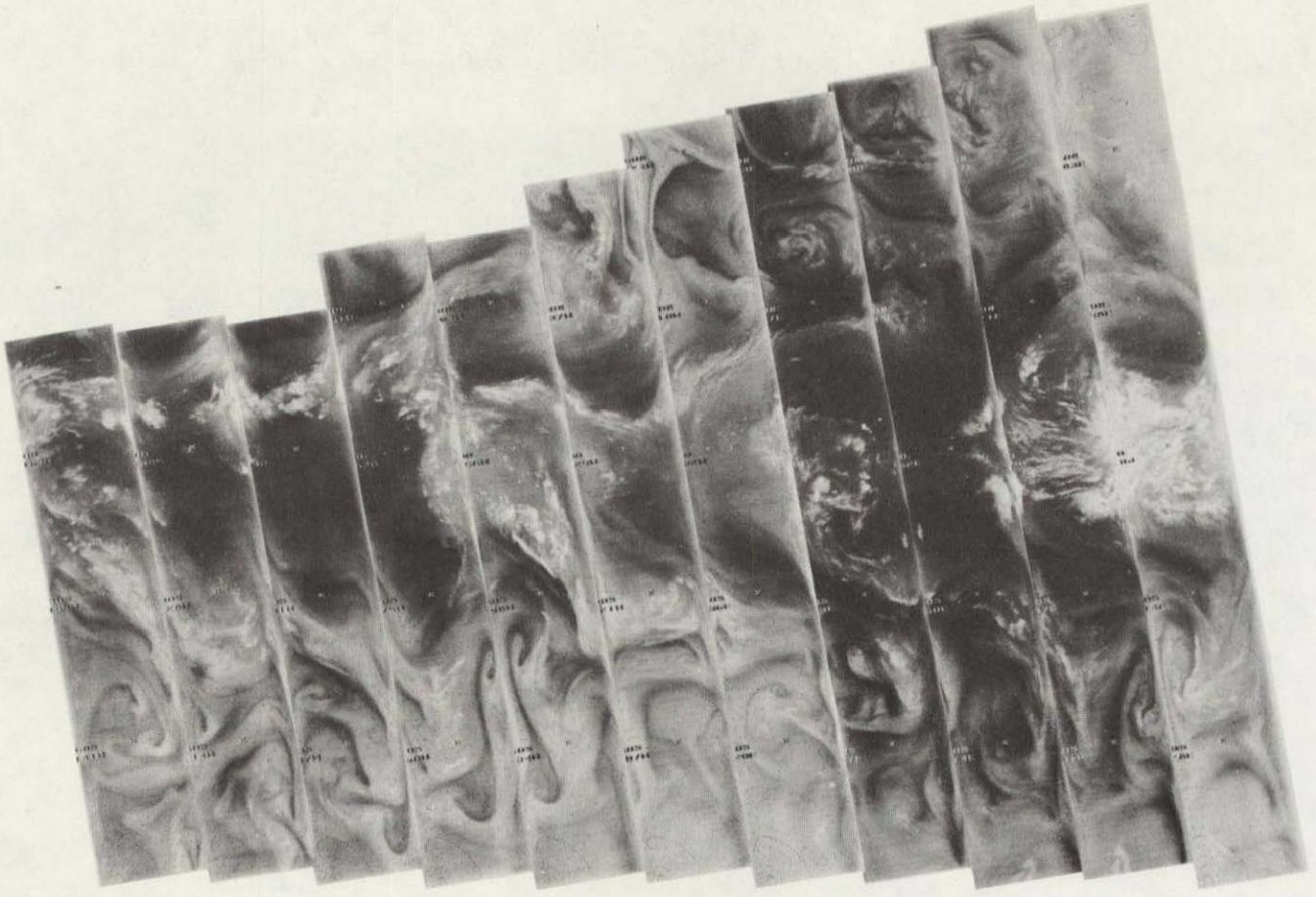
6.7μm



7070 7069 7068 7067 7066 7065 7064 7063 7062 7061 7060 7059 7058

20 NOV 76

11.5μm



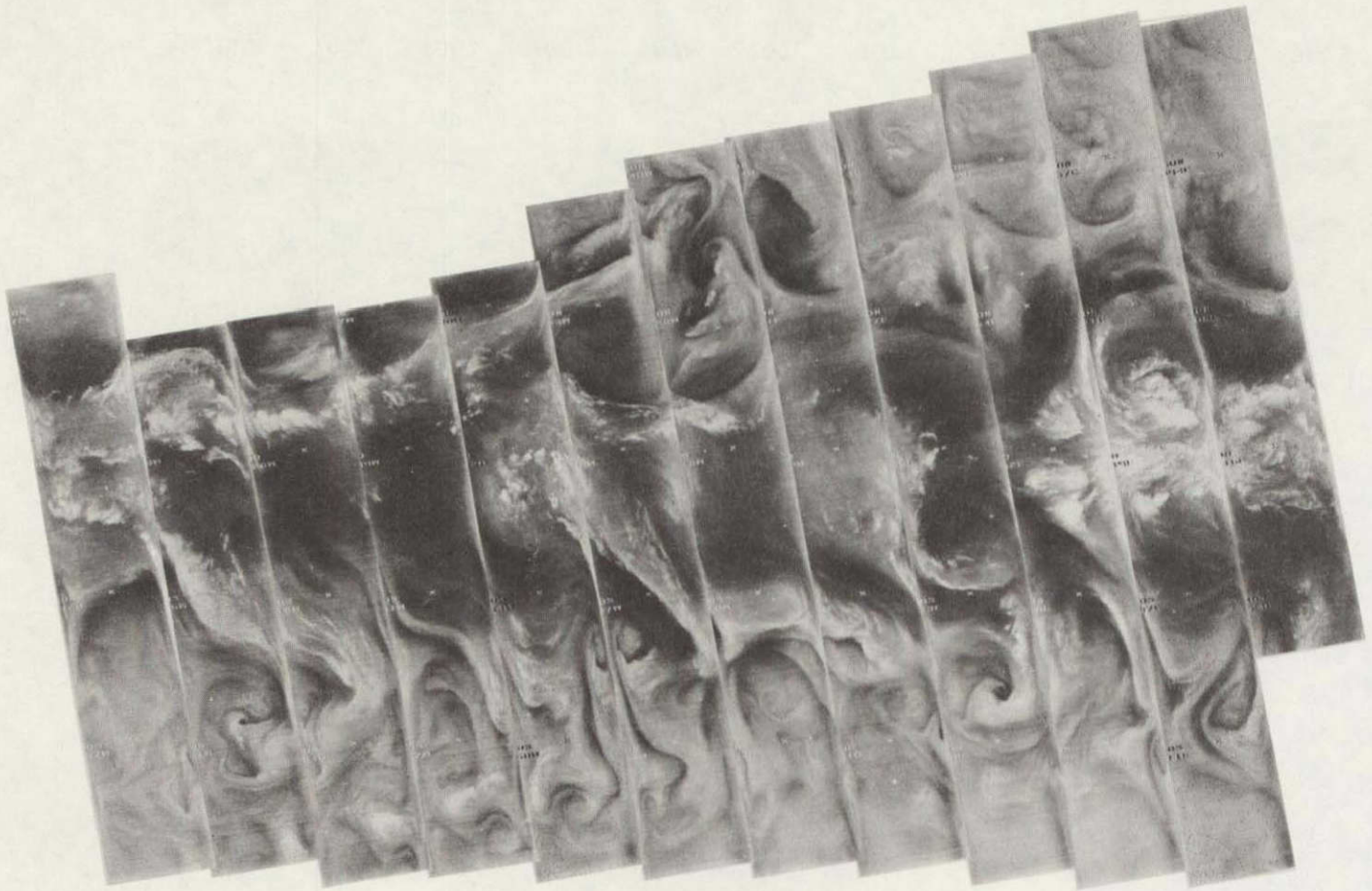
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21 NOV 76

6.7μm

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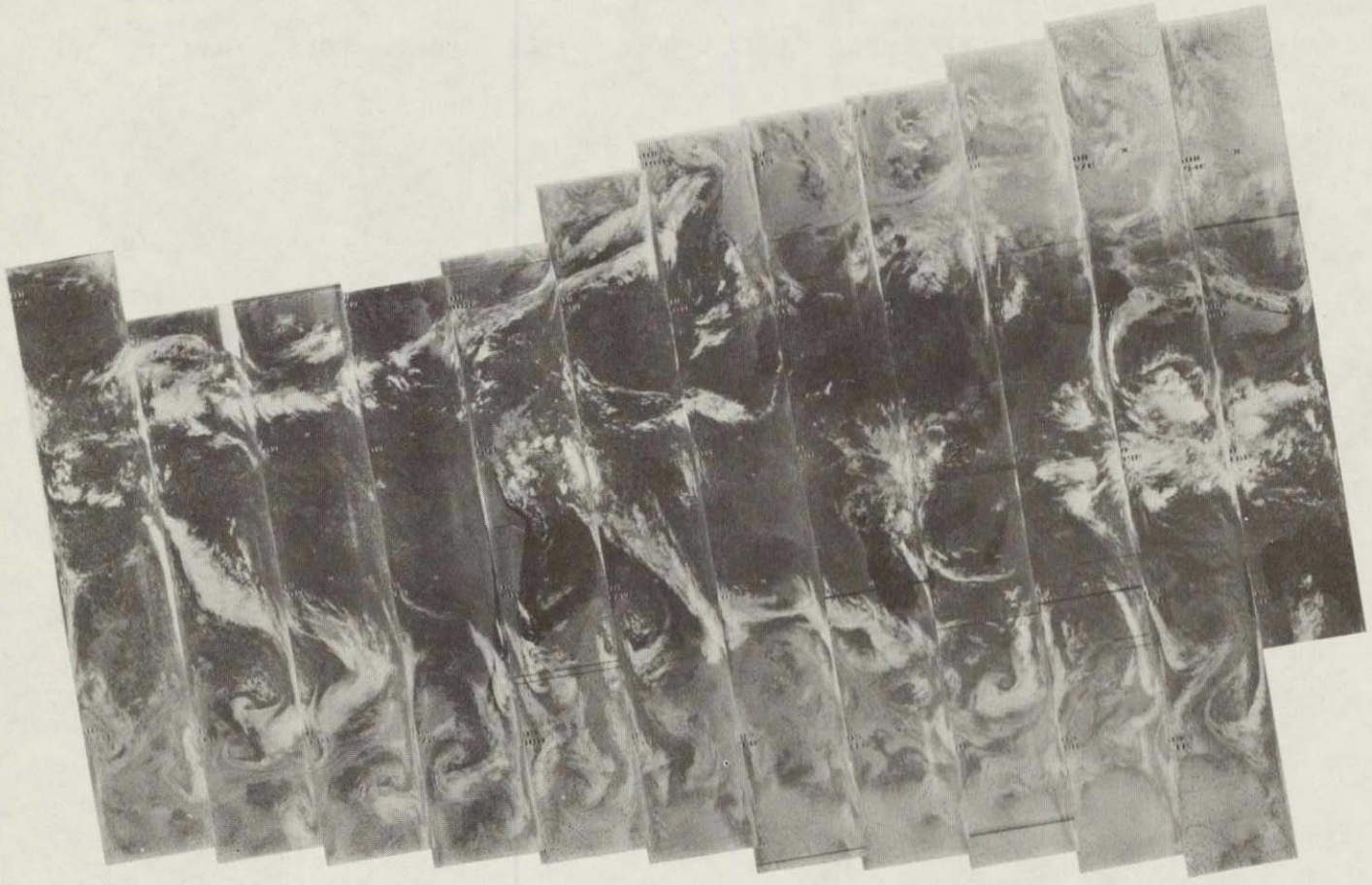




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22 NOV 76

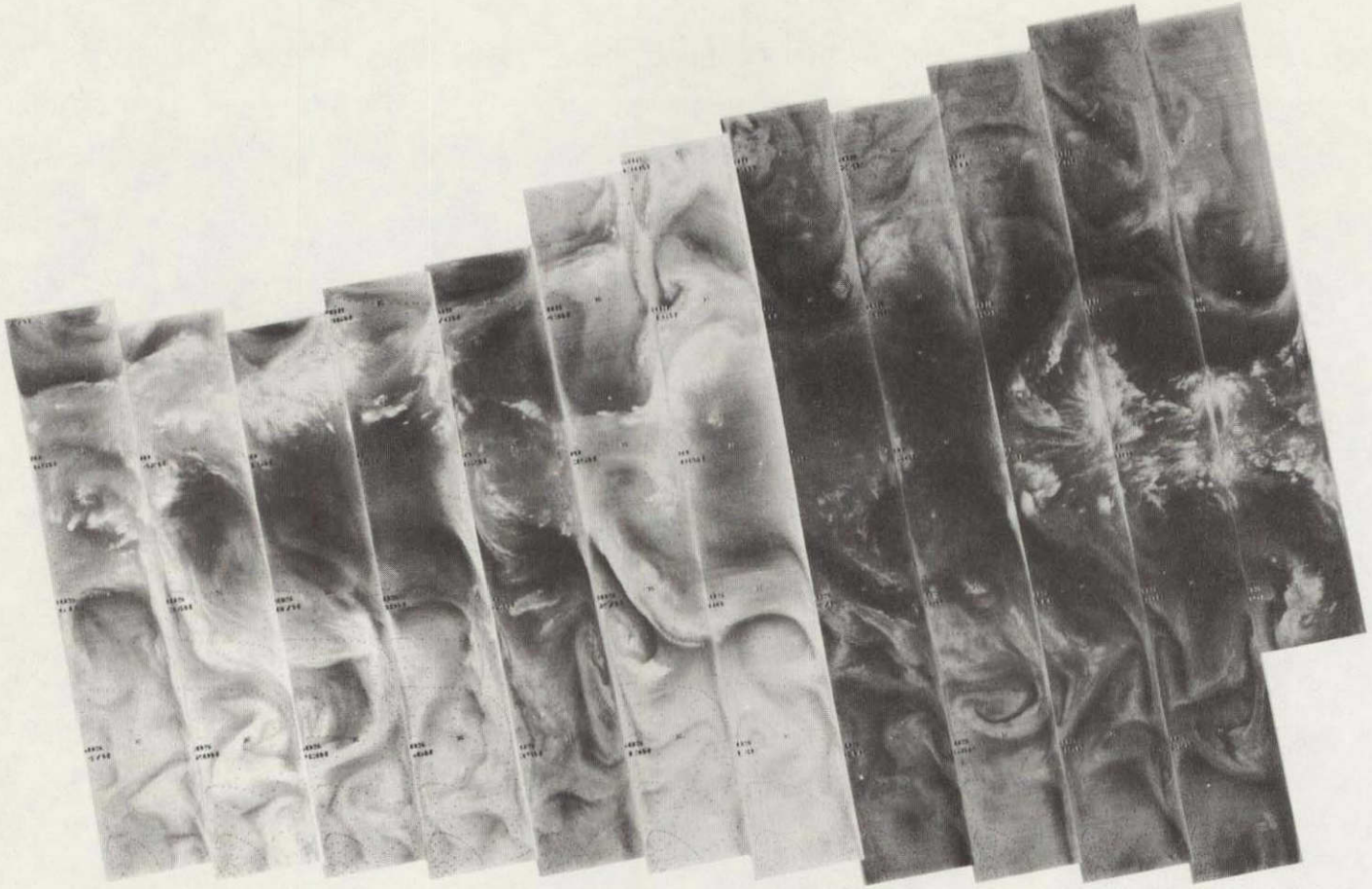
6.7μm



7097 7096 7095 7094 7093 7092 7091 7090 7089 7088 7087 7086 7085 7084

22 NOV 76

11.5μm



7110 7109 7108 7107 7106 7105 7104 7103 7102 7101 7100 7099 7098

23 NOV 76

6.7μm



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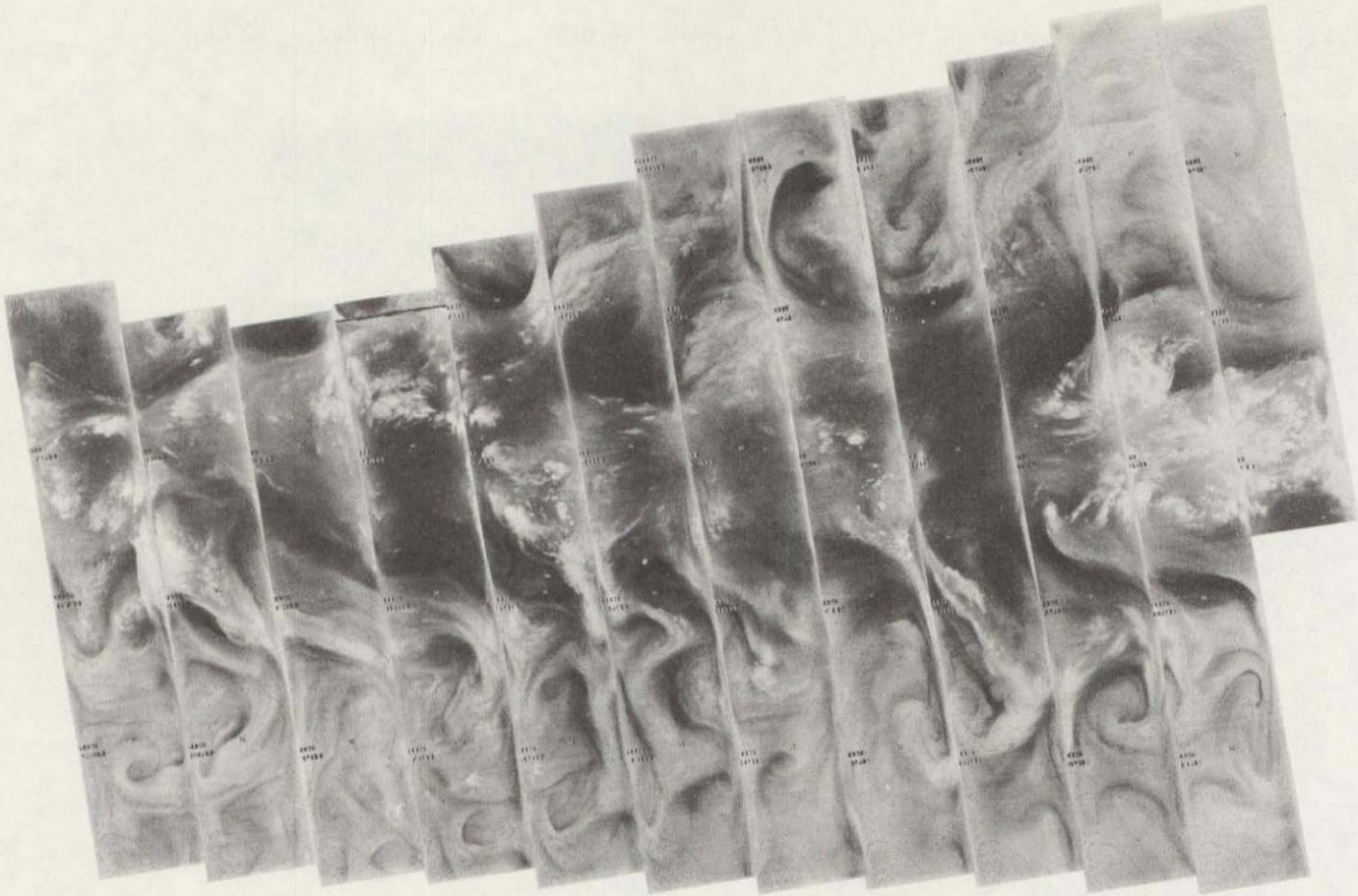
24 NOV 76

6.7μm

7123 7122 7121 7120 7119 7118 7117 7116 7115 7114 7113 7112 7111

24 NOV 76

11.5μm



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25 NOV 76

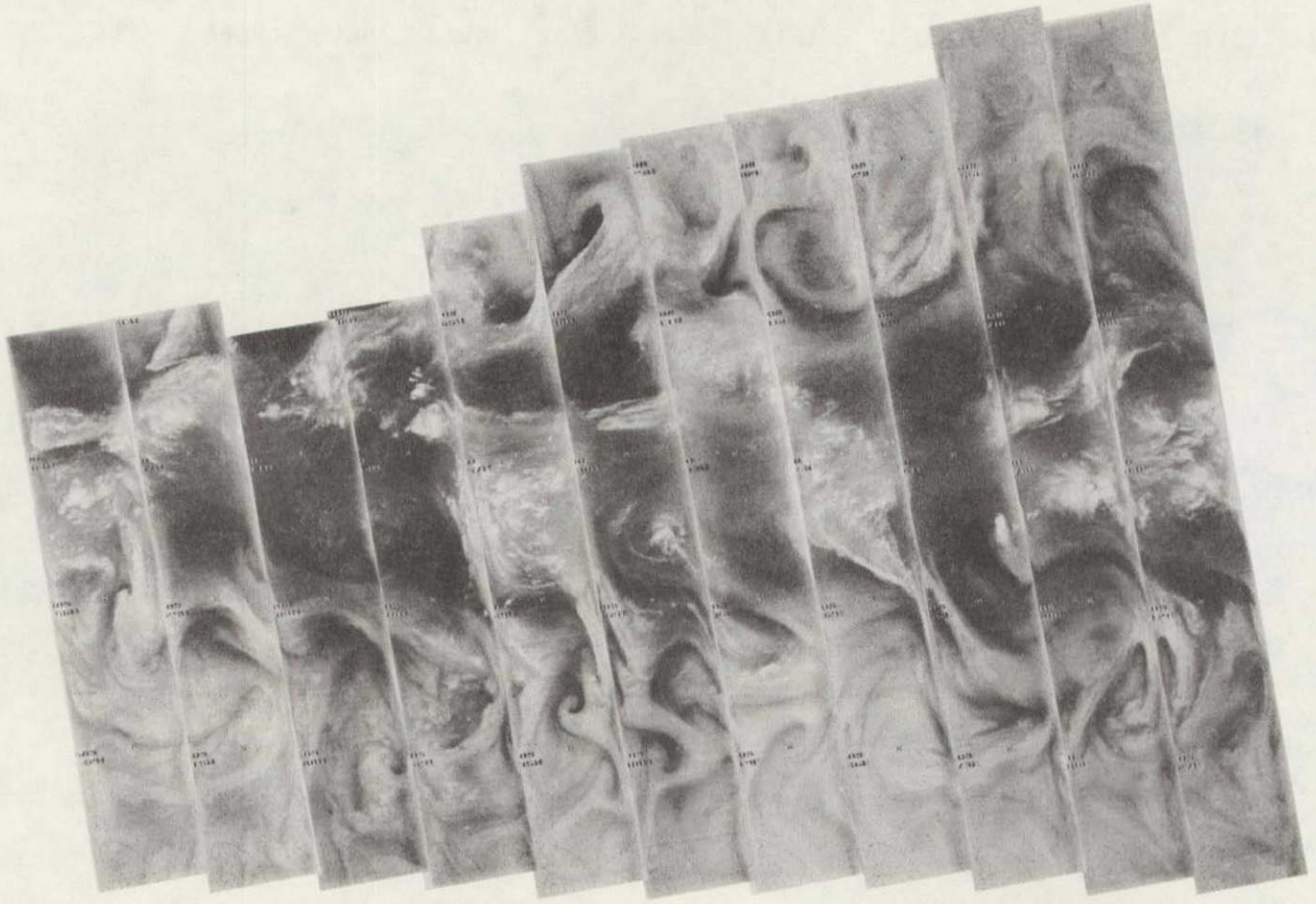
6.7μm

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25 NOV 76

11.5μm

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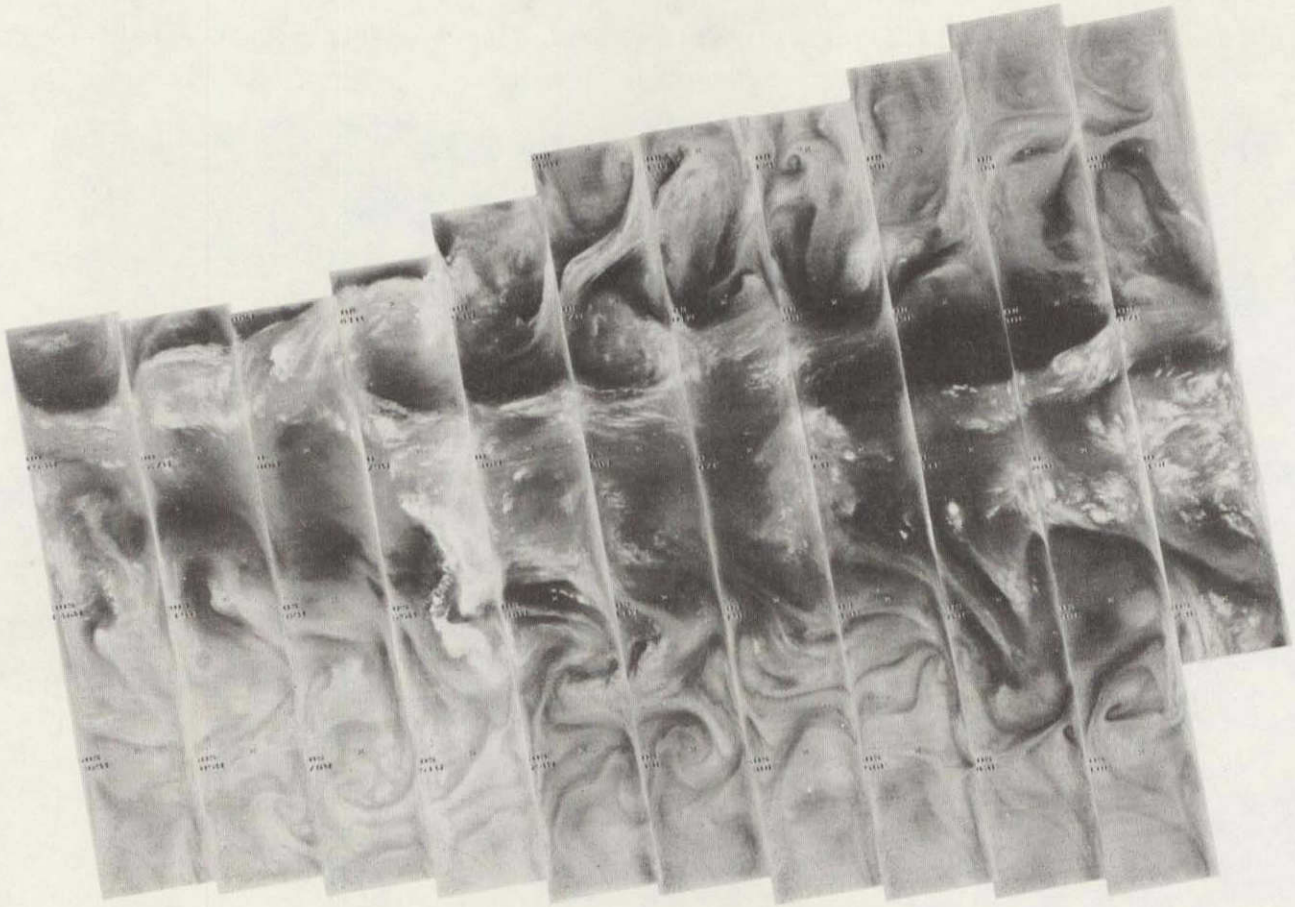
26 NOV 76

6.7μm

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26 NOV 76

11.5μm



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27 NOV 76

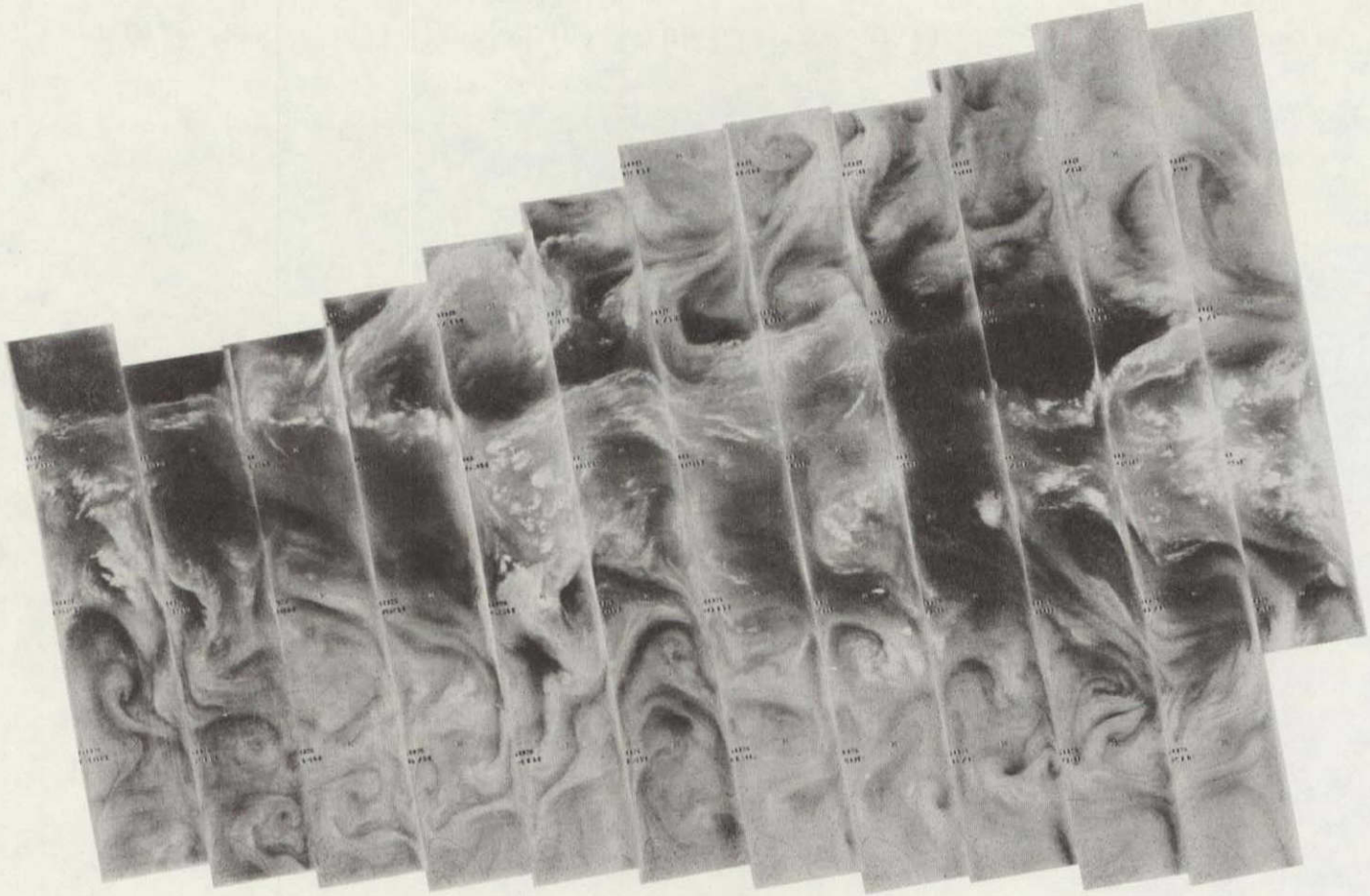
6.7μm

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27 NOV 76

11.5μm

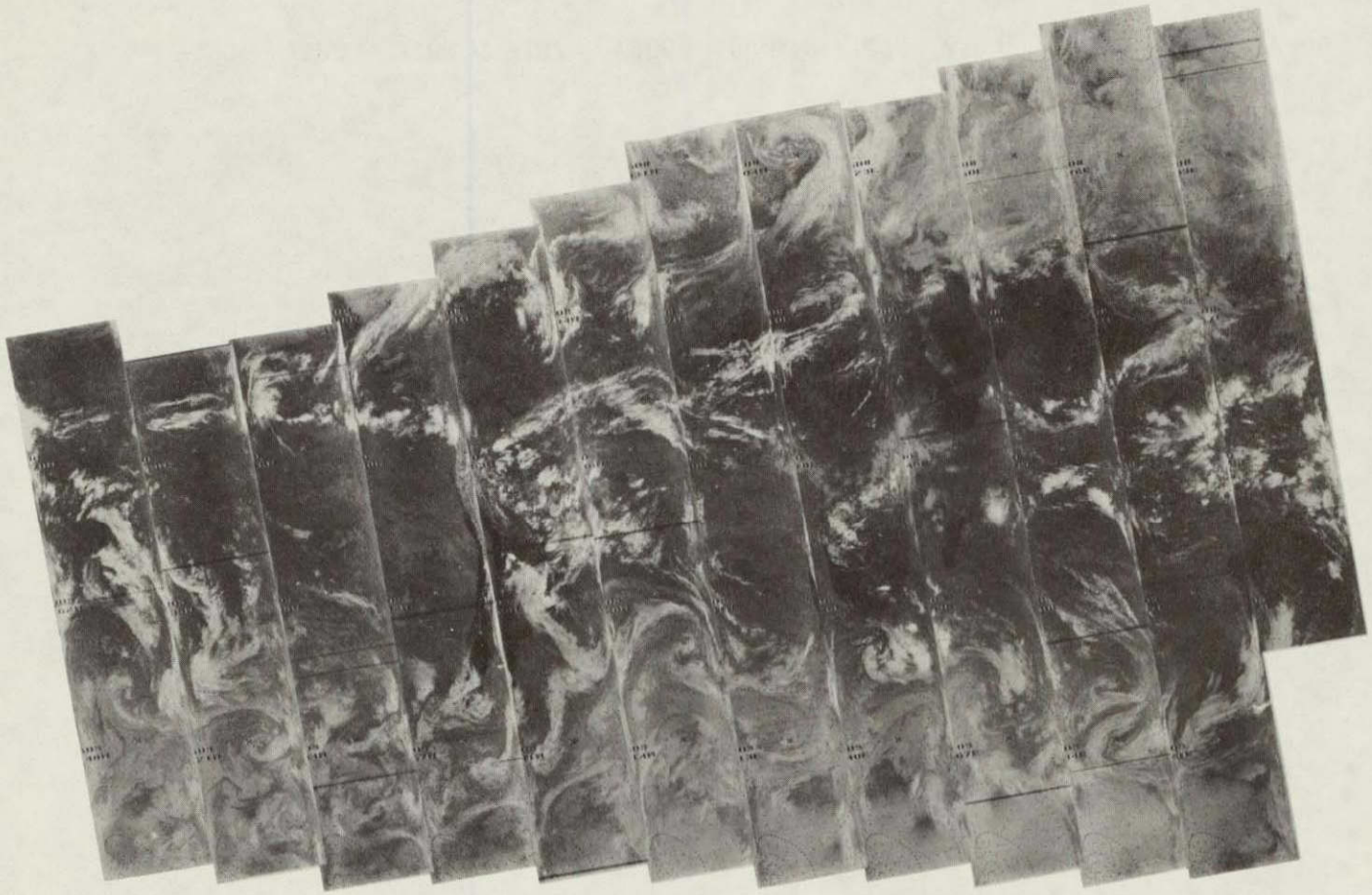
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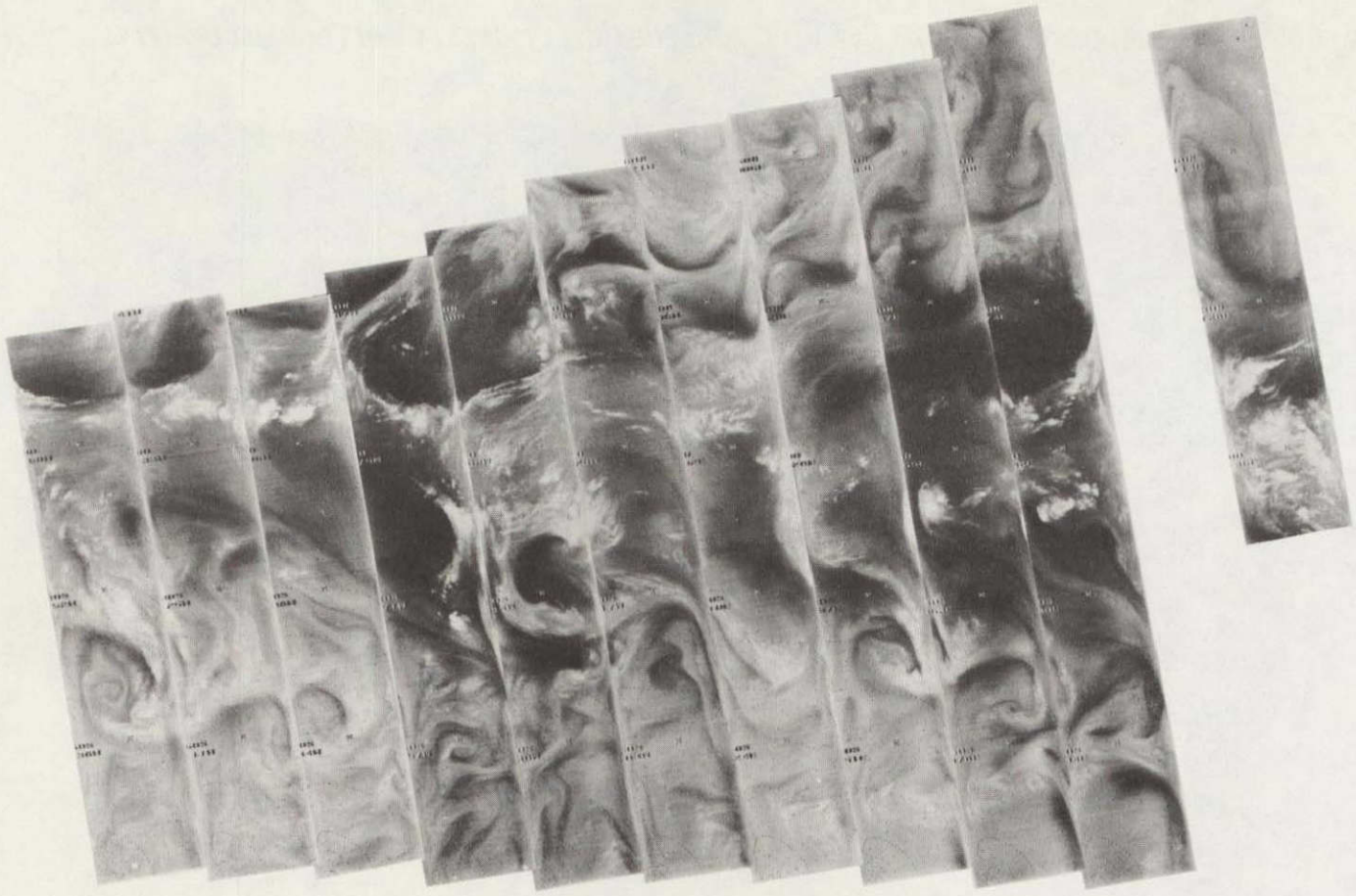
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28 NOV 76

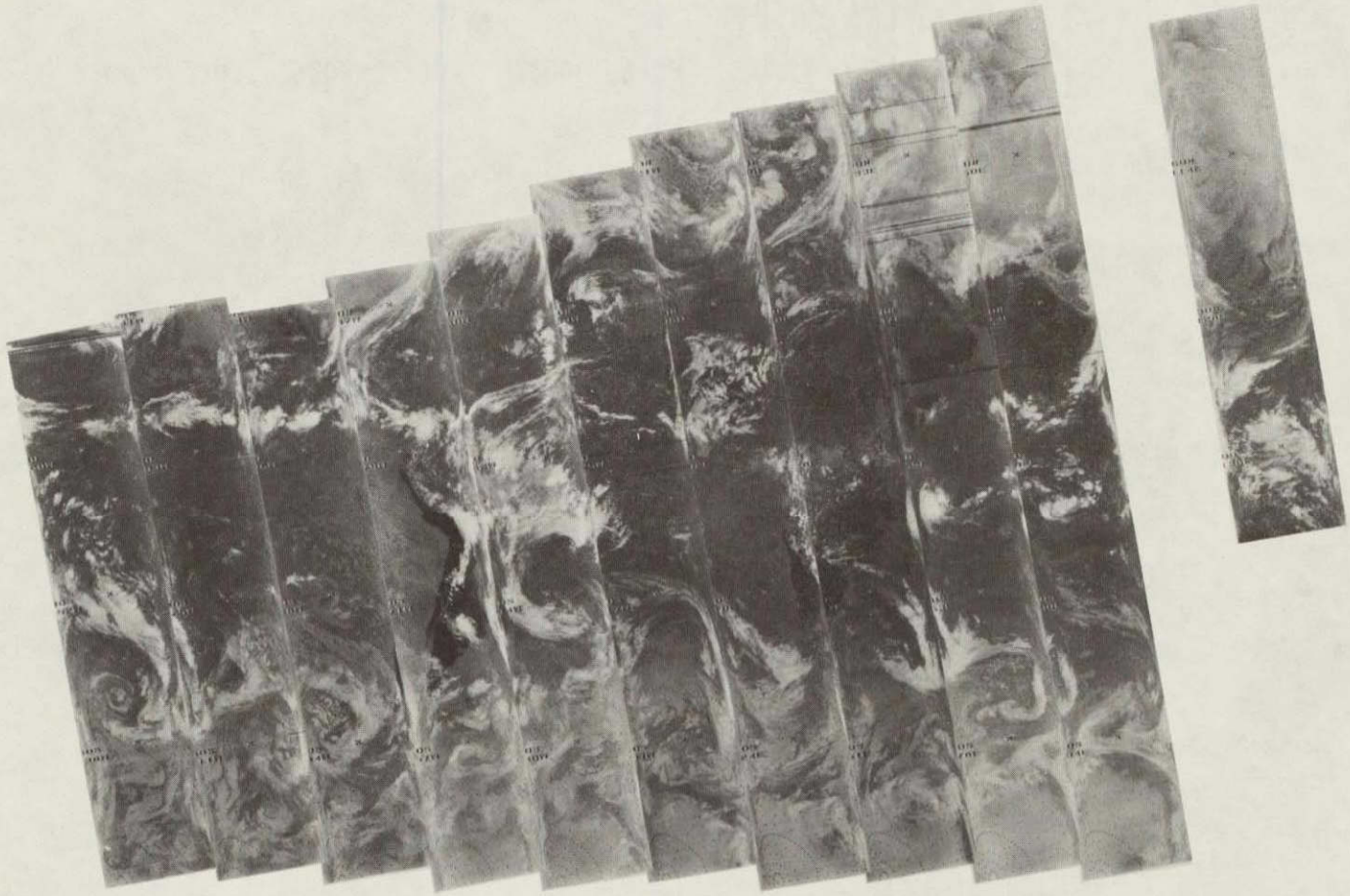
11.5μm



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29 NOV 76

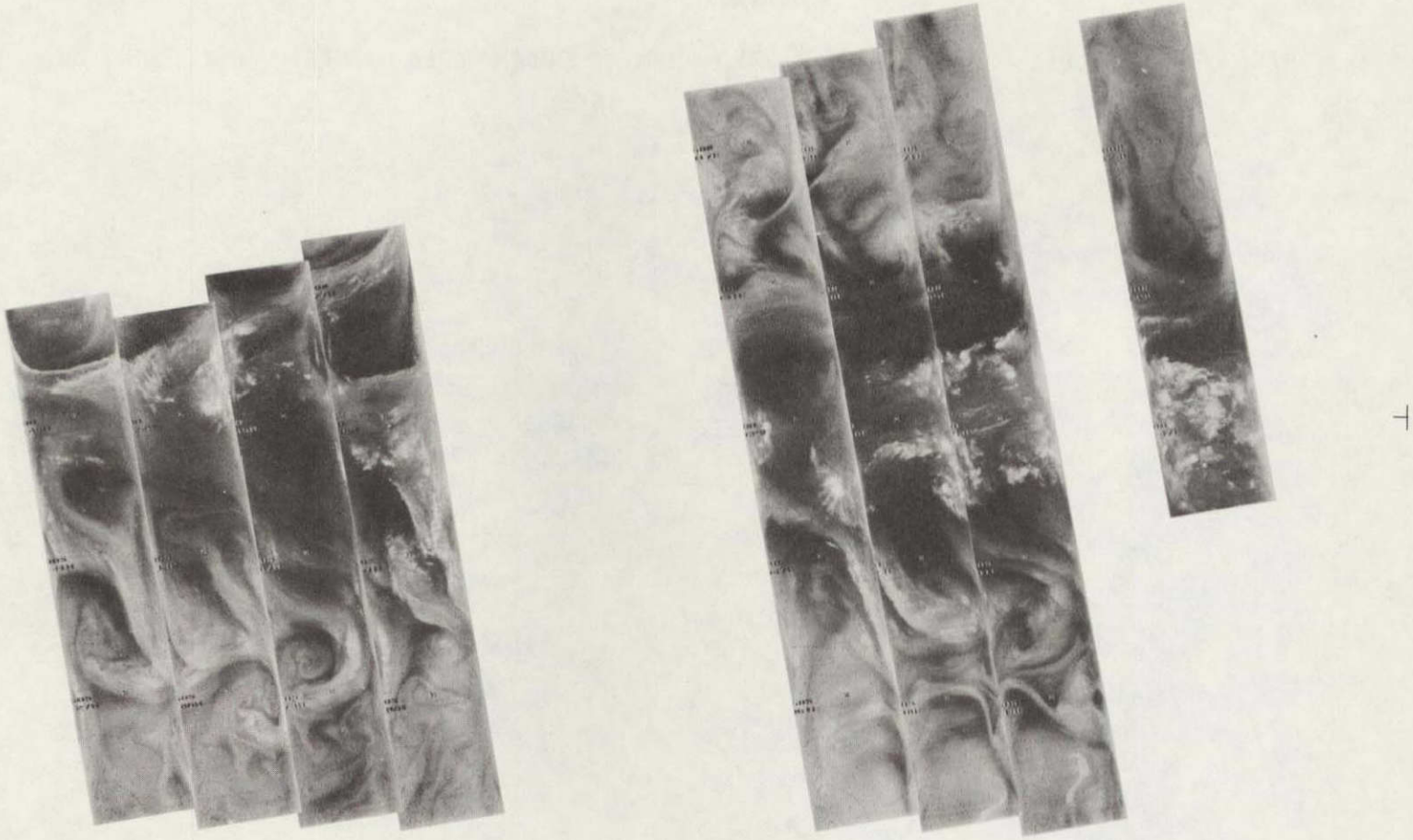
6.7μm



7190 7189 7188 7187 7186 7185 7184 7183 7182 7181 7180 7179 7178

29 NOV 76

11.5μm



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30 NOV 76

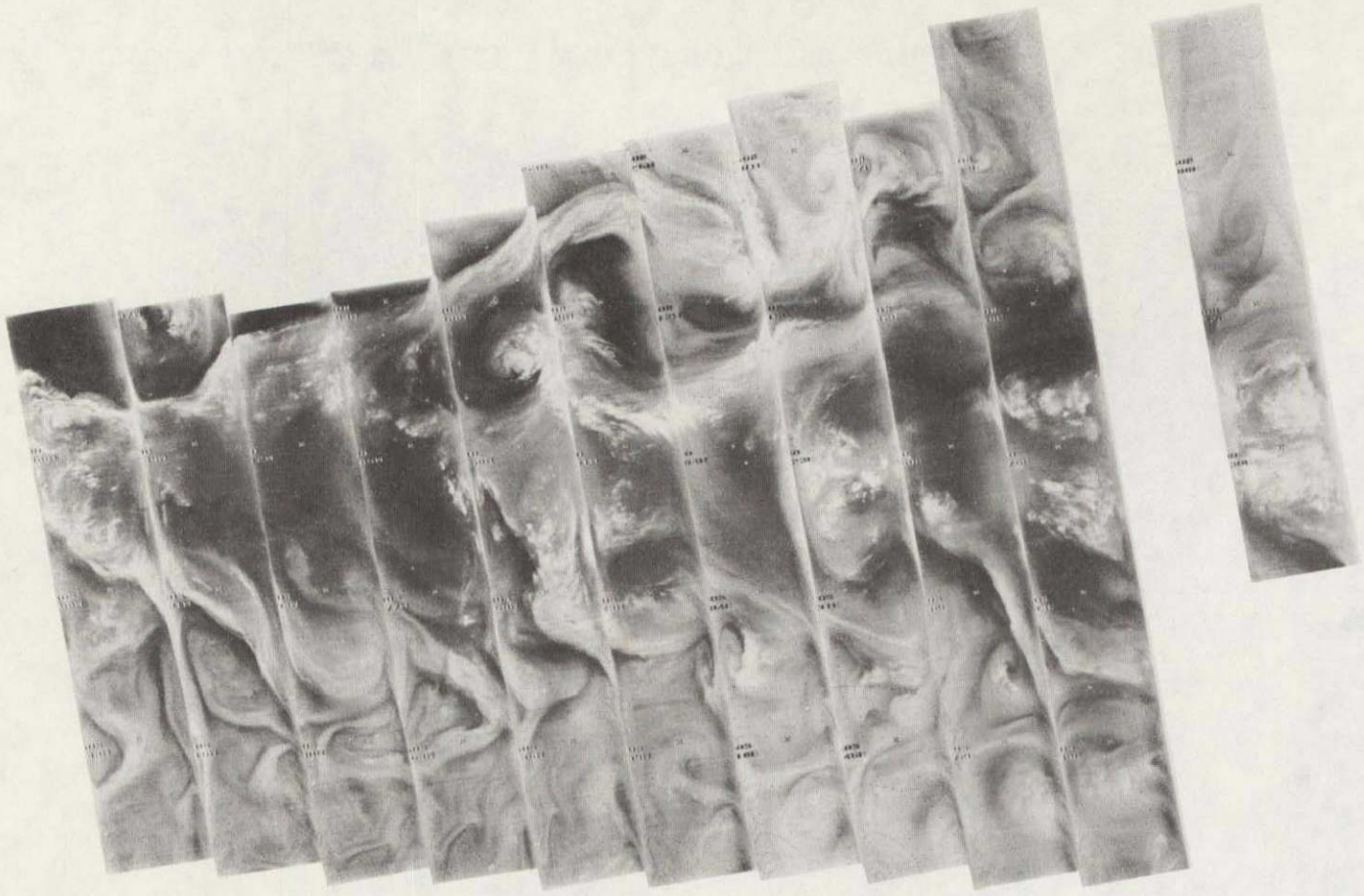
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30 NOV 76

11.5μm

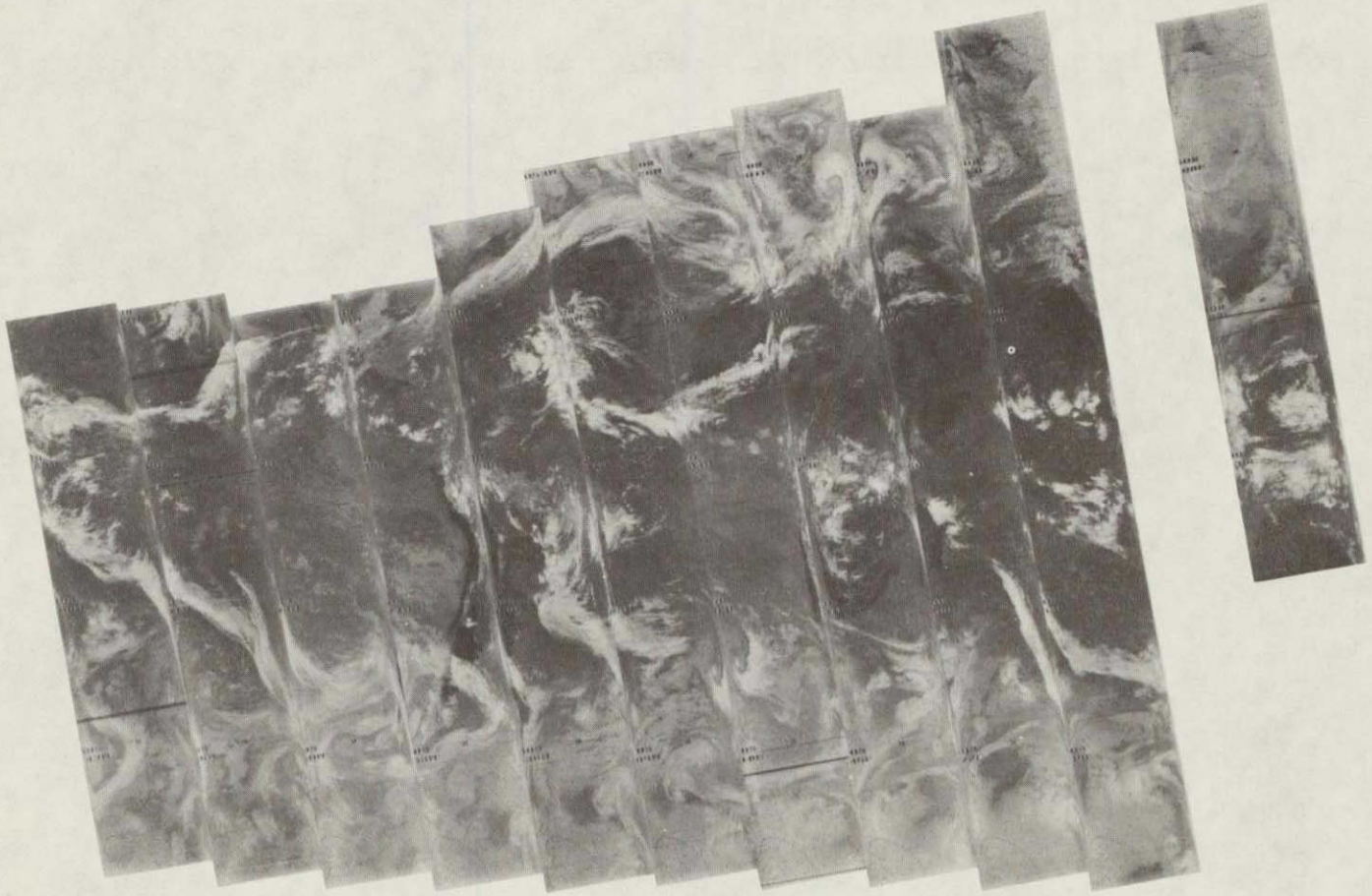
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1 DEC 76

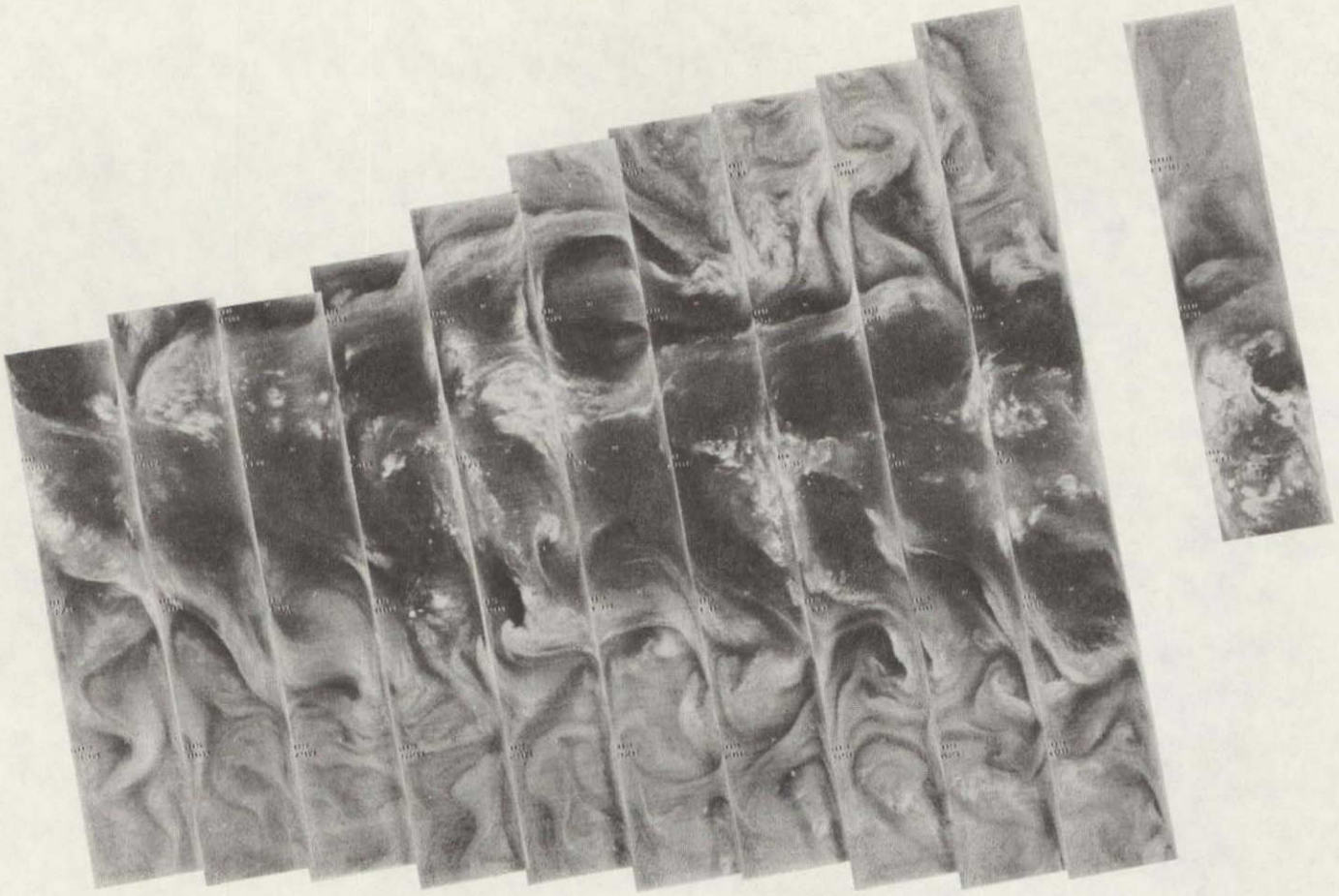
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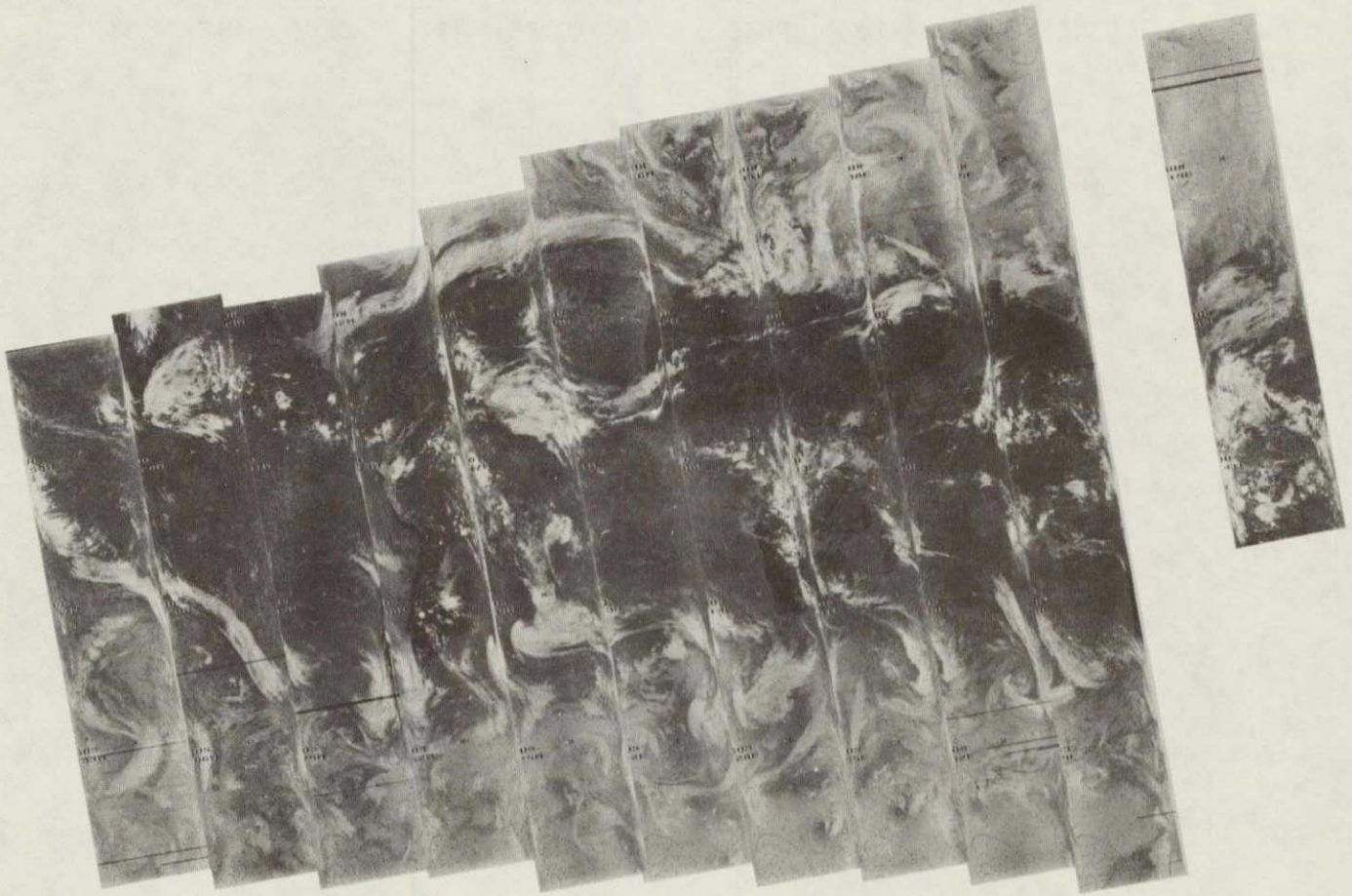
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2 DEC 76

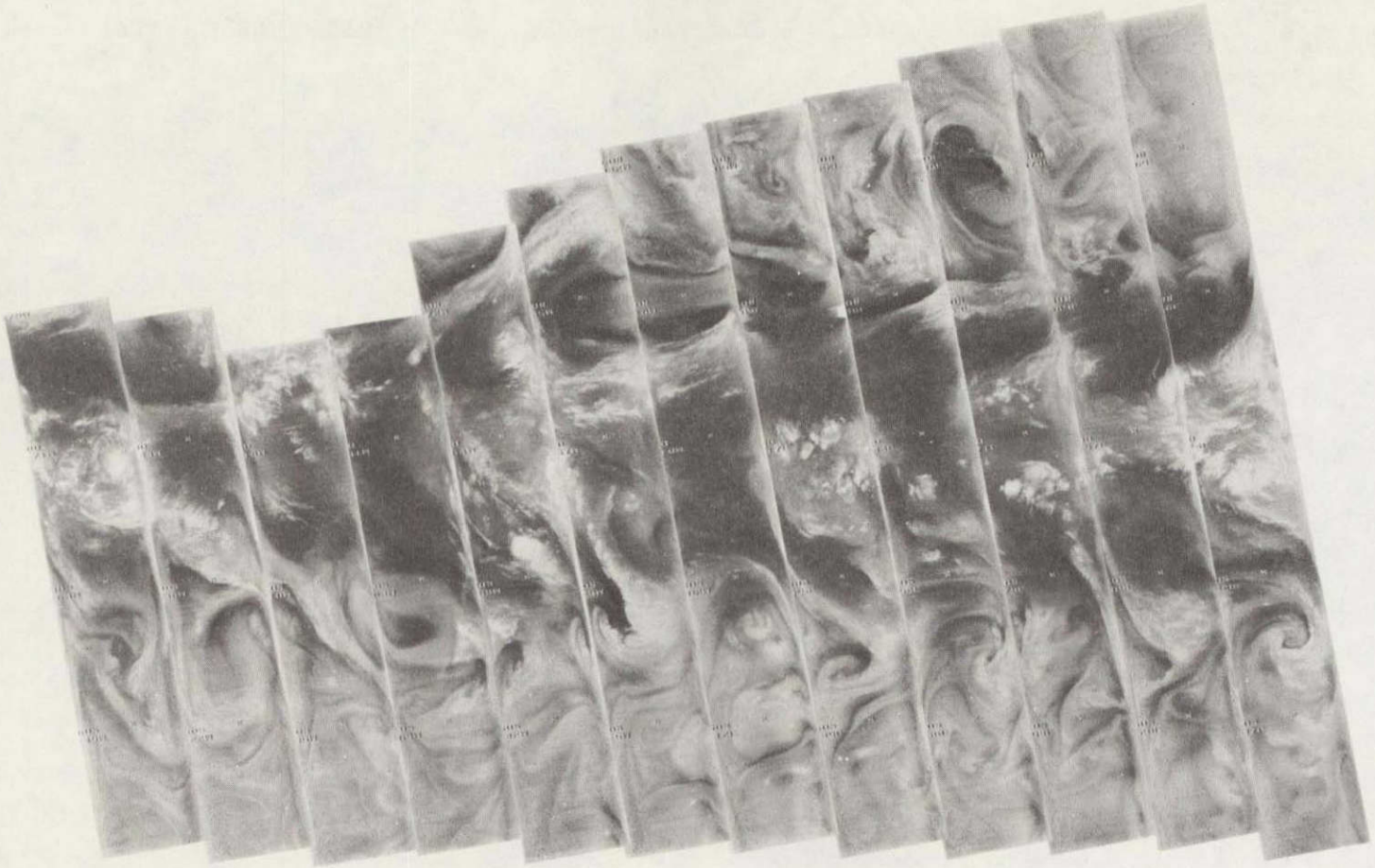
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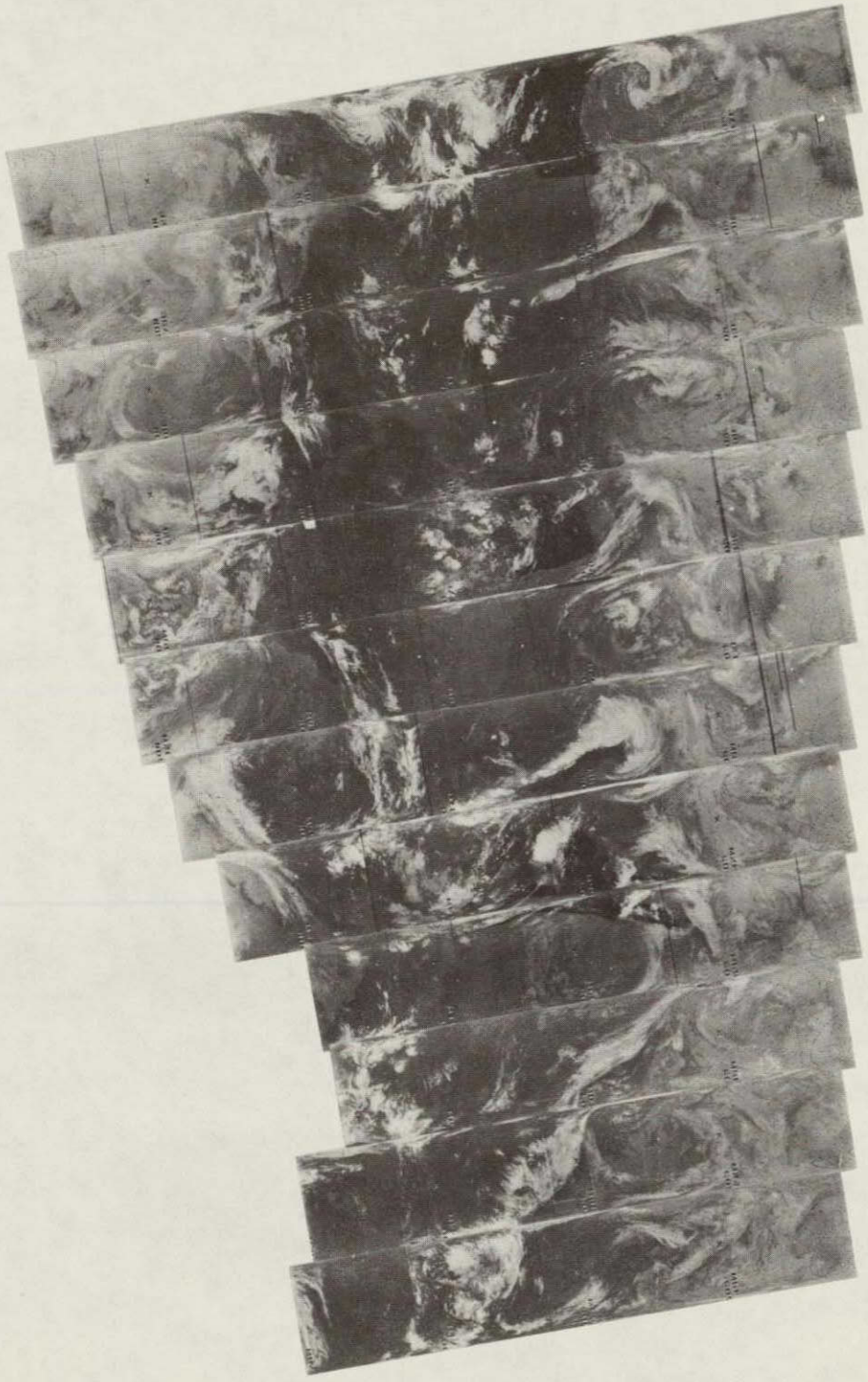
11.5μm



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3 DEC 76

6.7μm



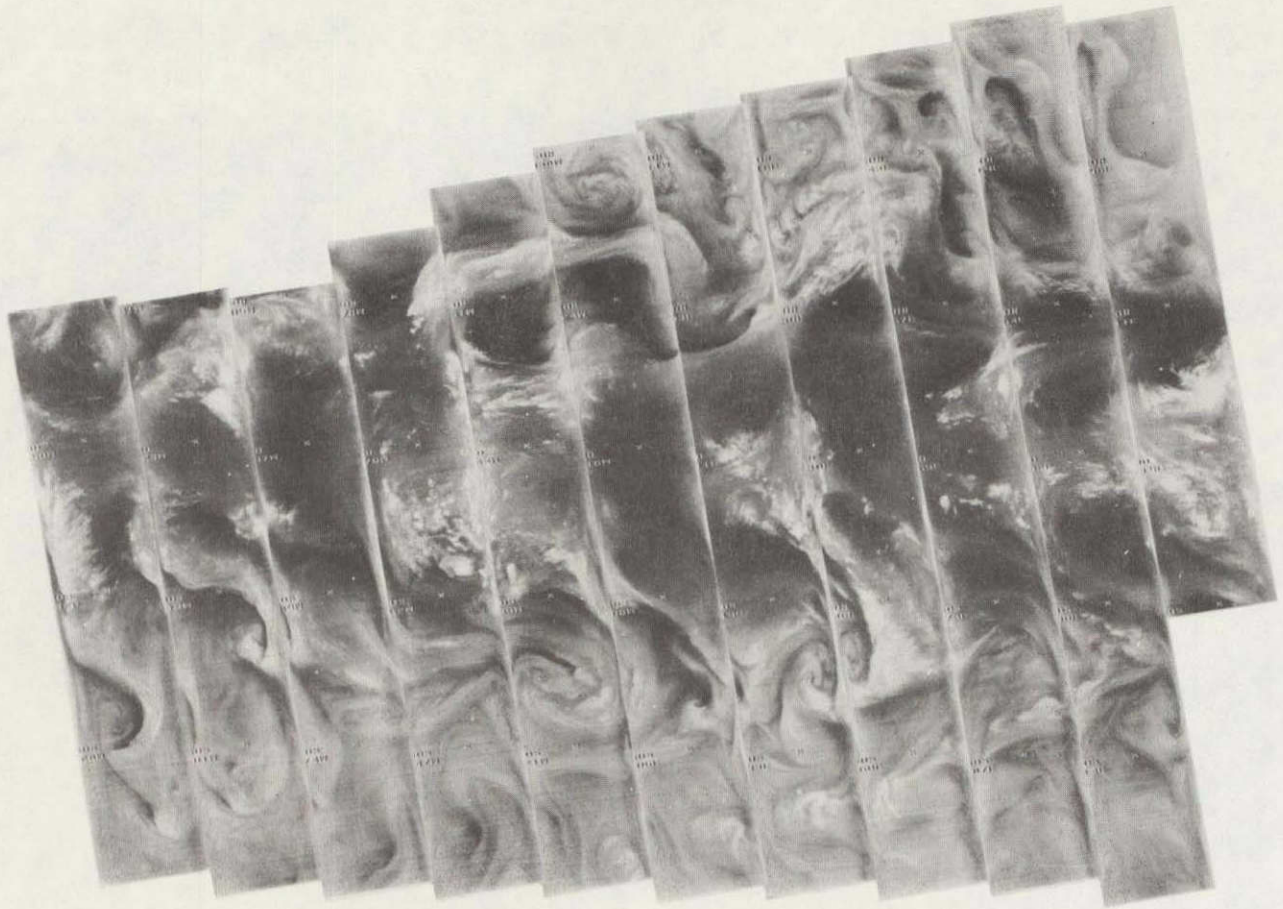
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7257 7256 7255 7254 7253 7252 7251 7250 7249 7248 7247 7246 7245

4 DEC 76

6.7μm

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7271 7270 7269 7268 7267 7266 7265 7264 7263 7262 7261 7260 7259 7258

5 DEC 76

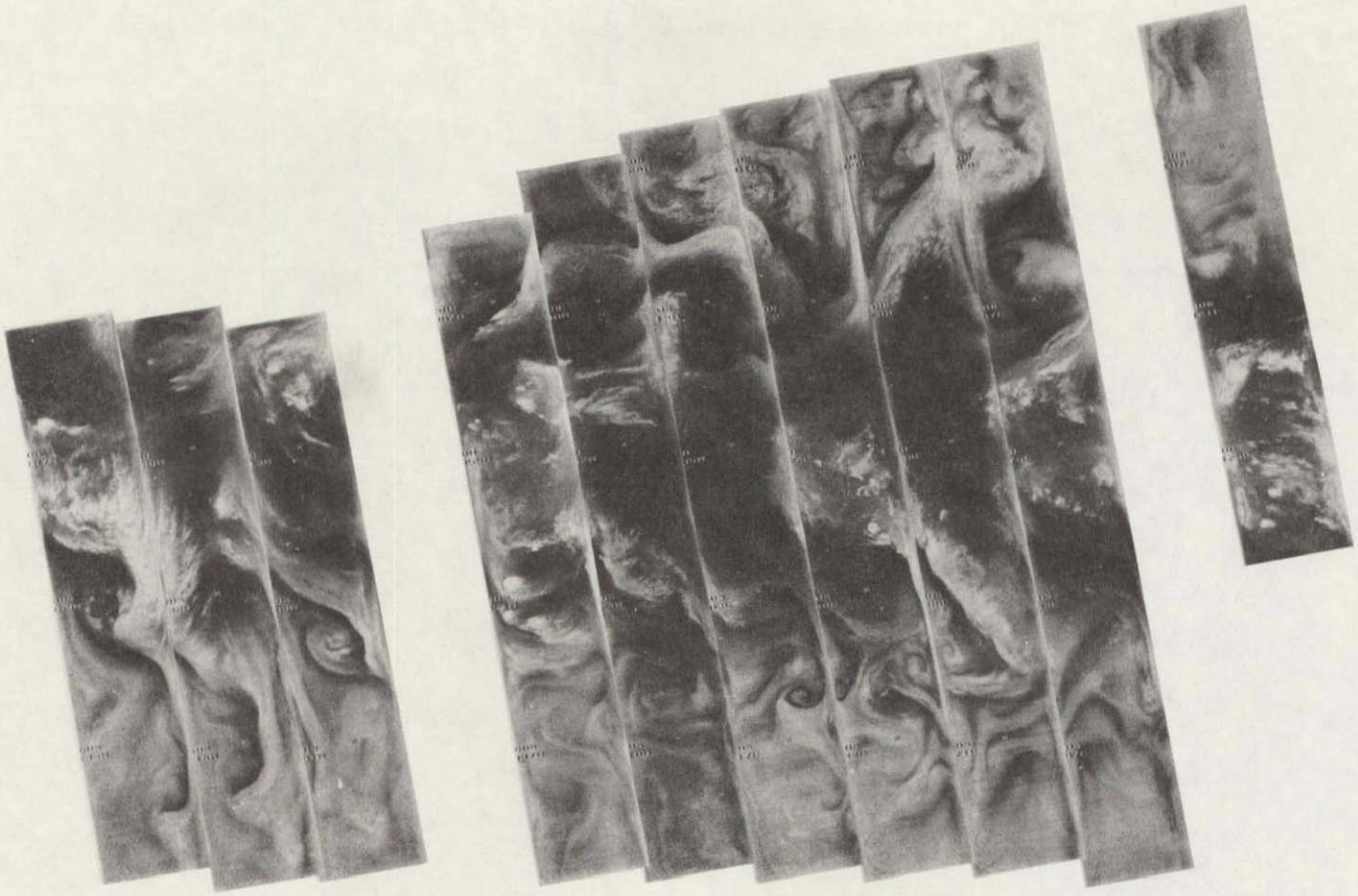
6.7μm

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5 DEC 76

11.5μm

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6 DEC 76

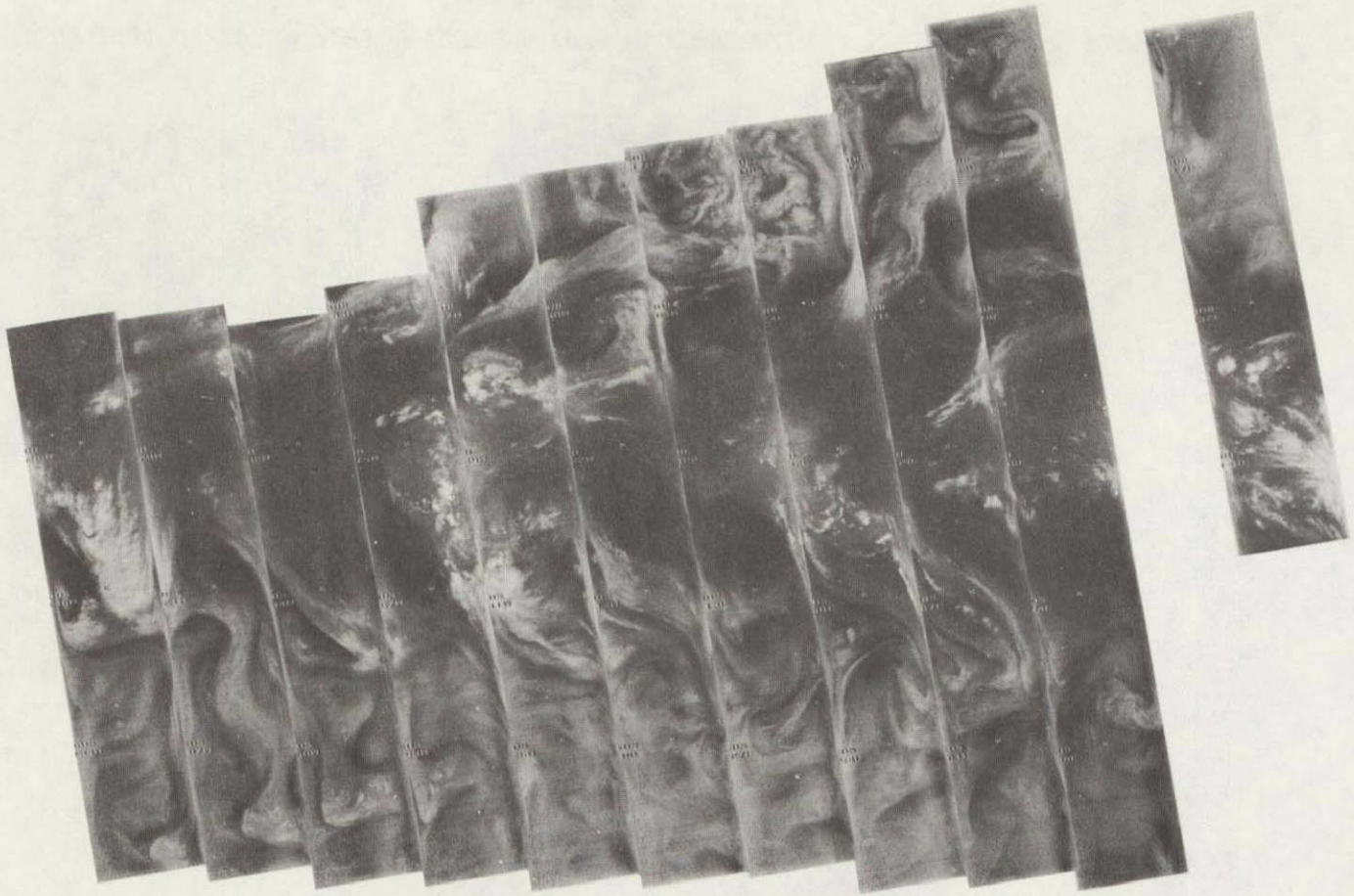
6.7μm

7284 7283 7282 7281 7280 7279 7278 7277 7276 7275 7274 7273 7272

6 DEC 76

11.5μm

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7 DEC 76

6.7μm

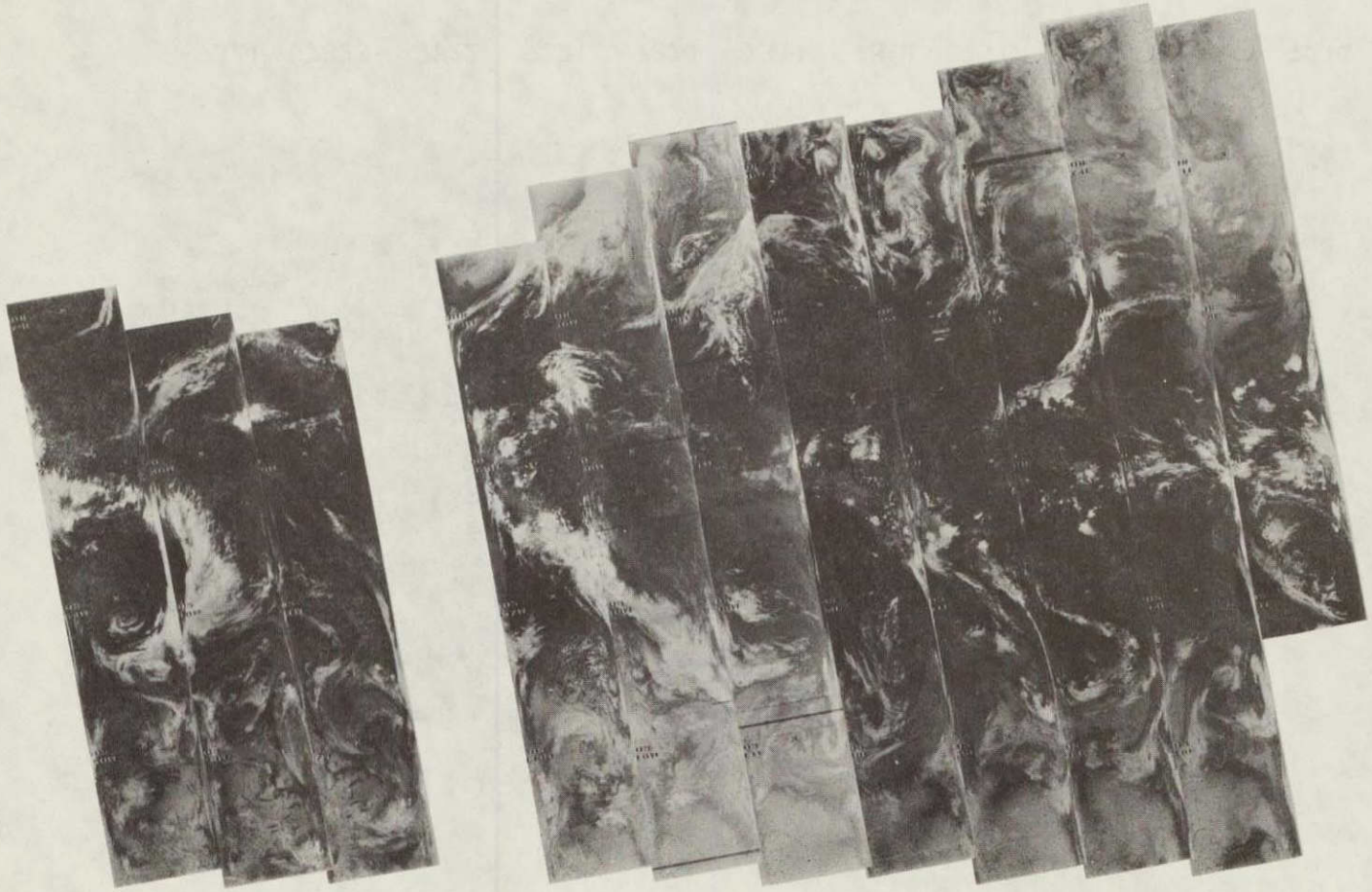


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7311 7310 7309 7308 7307 7306 7305 7304 7303 7302 7301 7300 7299

8 DEC 76

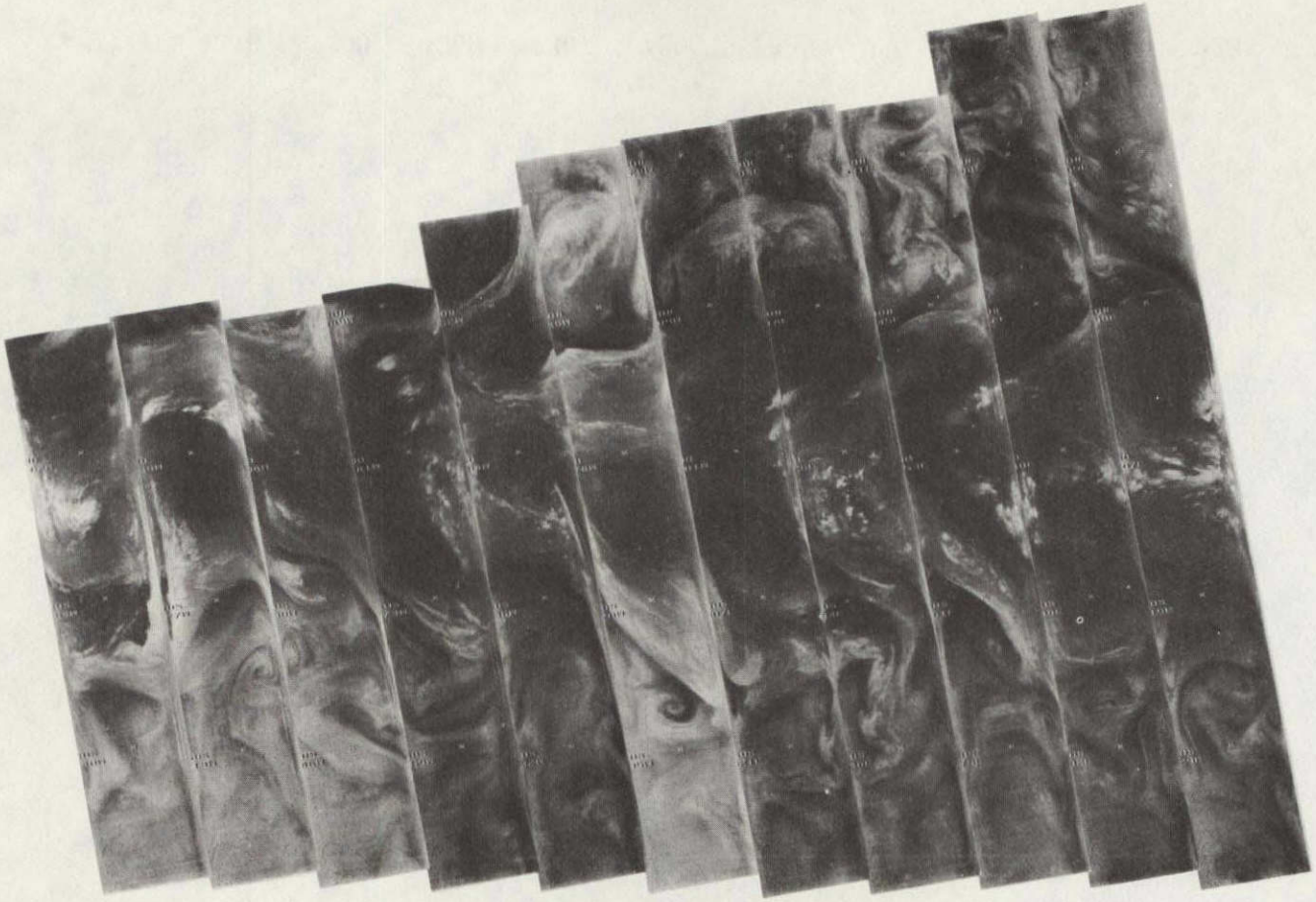
6.7μm



7311 7310 7309 7308 7307 7306 7305 7304 7303 7302 7301 7300 7299

8 DEC 76

11.5μm



7324 7323 7322 7321 7320 7319 7318 7317 7316 7315 7314 7313 7312

9 DEC 76

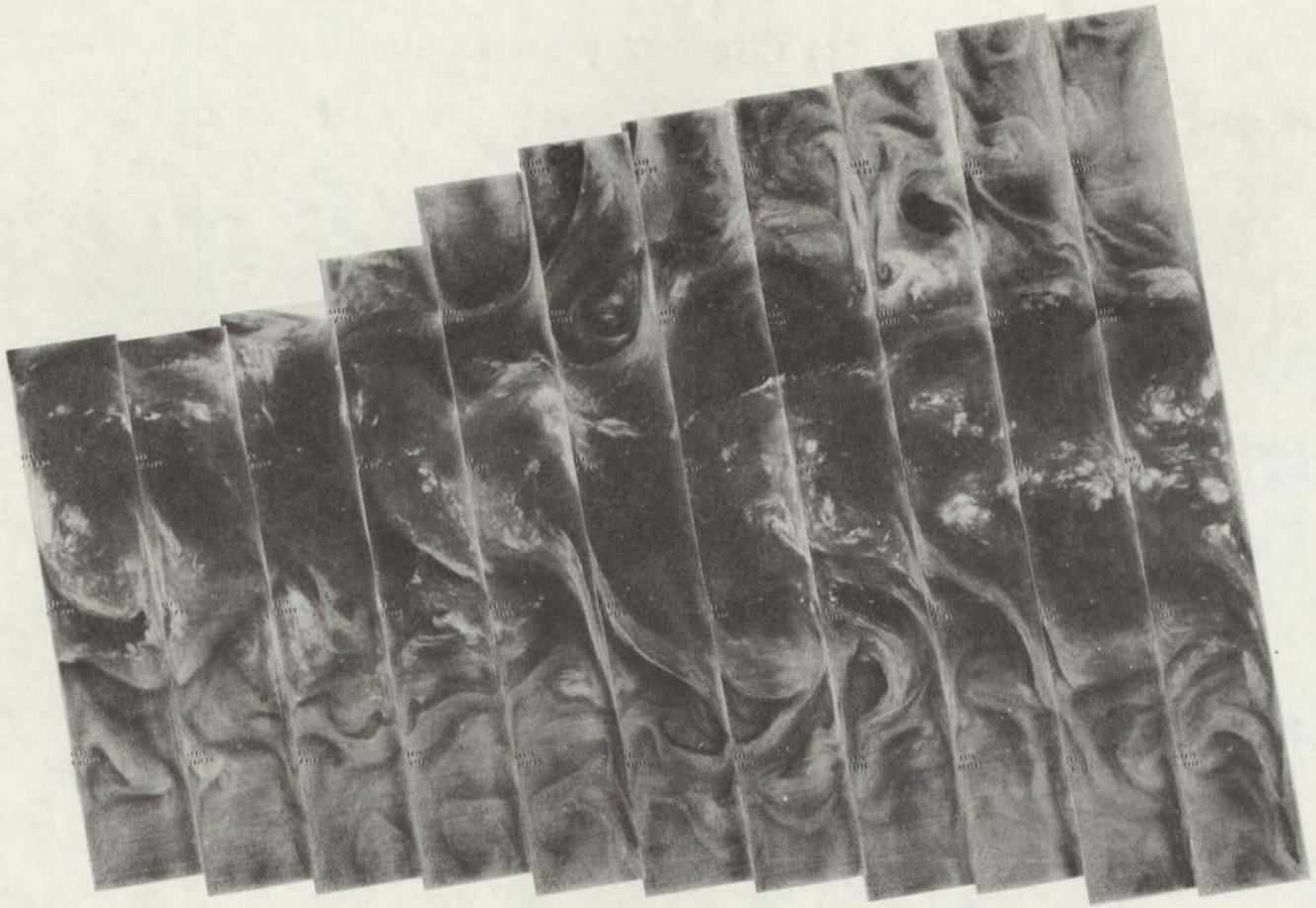
6.7μm

7324 7323 7322 7321 7320 7319 7318 7317 7316 7315 7314 7313 7312

9 DEC 76

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10 DEC 76

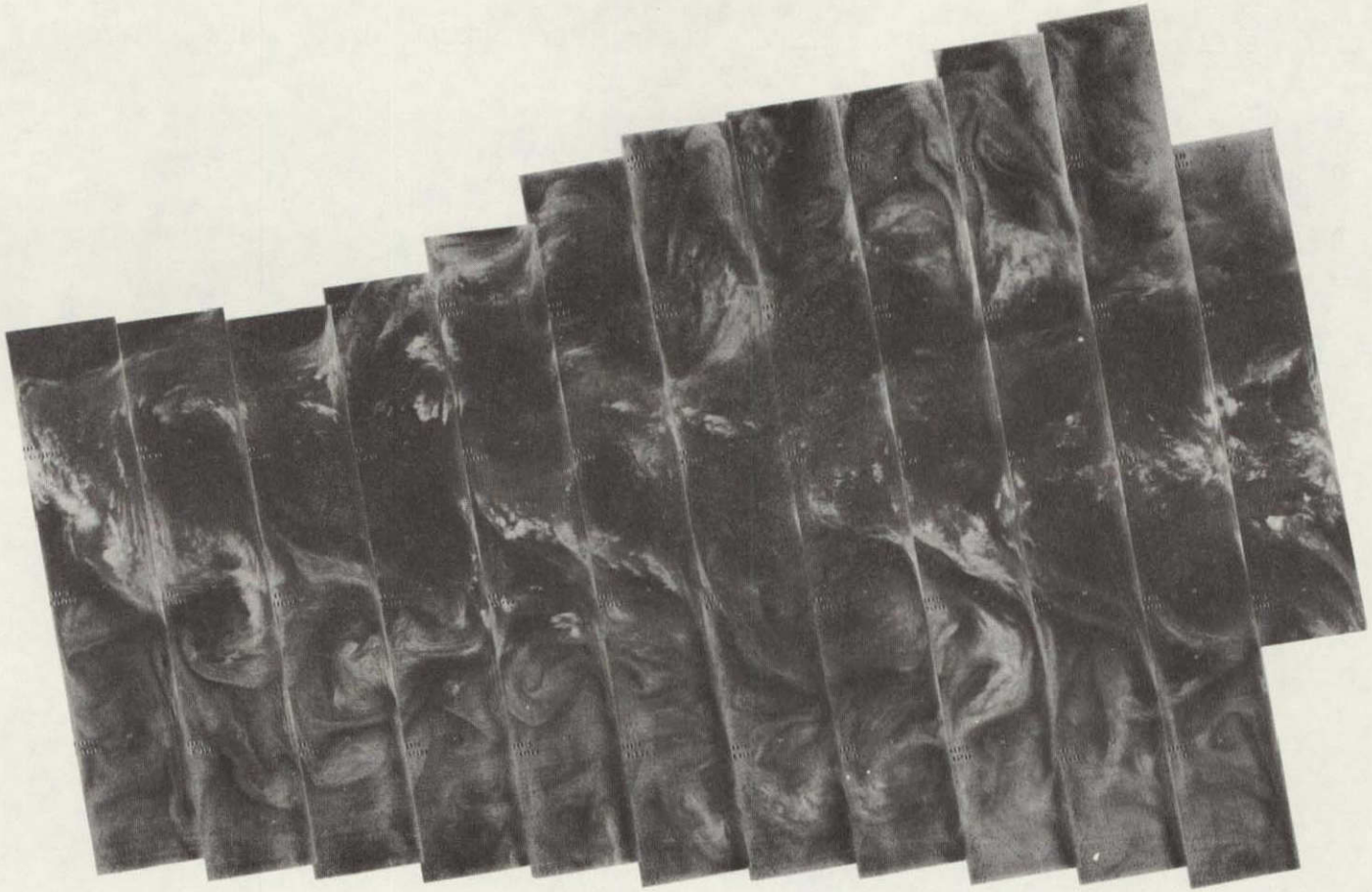
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10 DEC 76

11.5μm

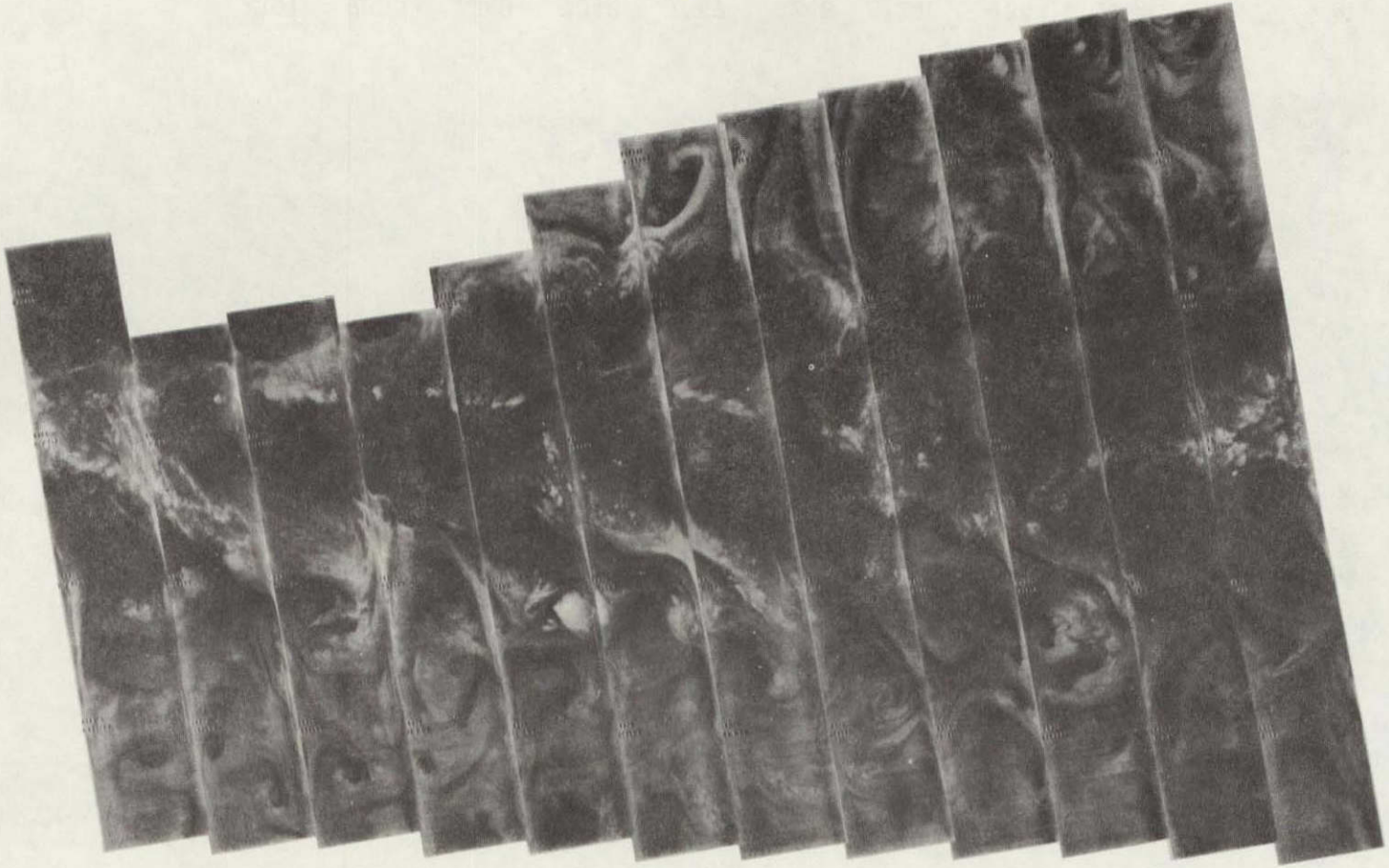


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11 DEC 76

6.7μm

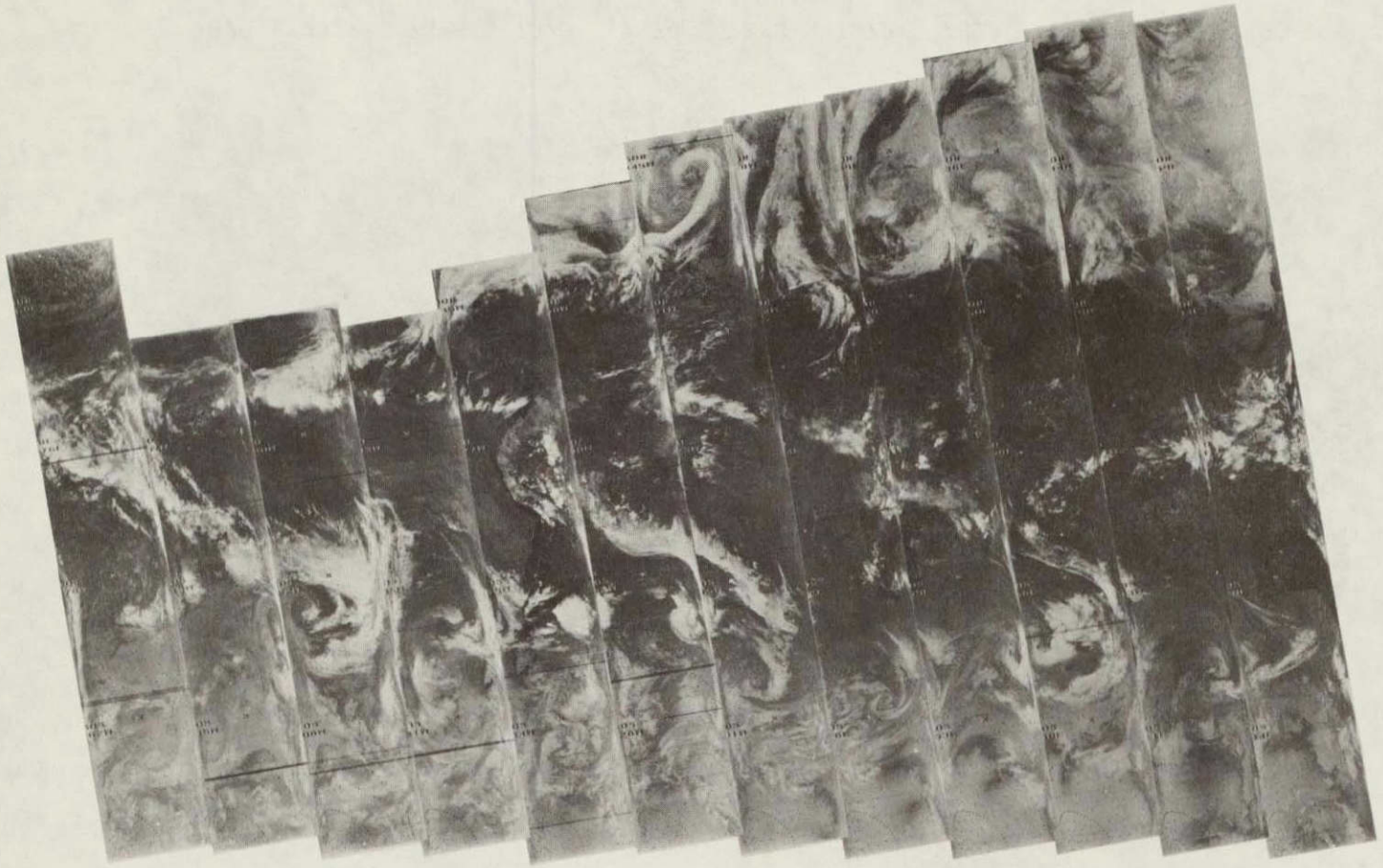
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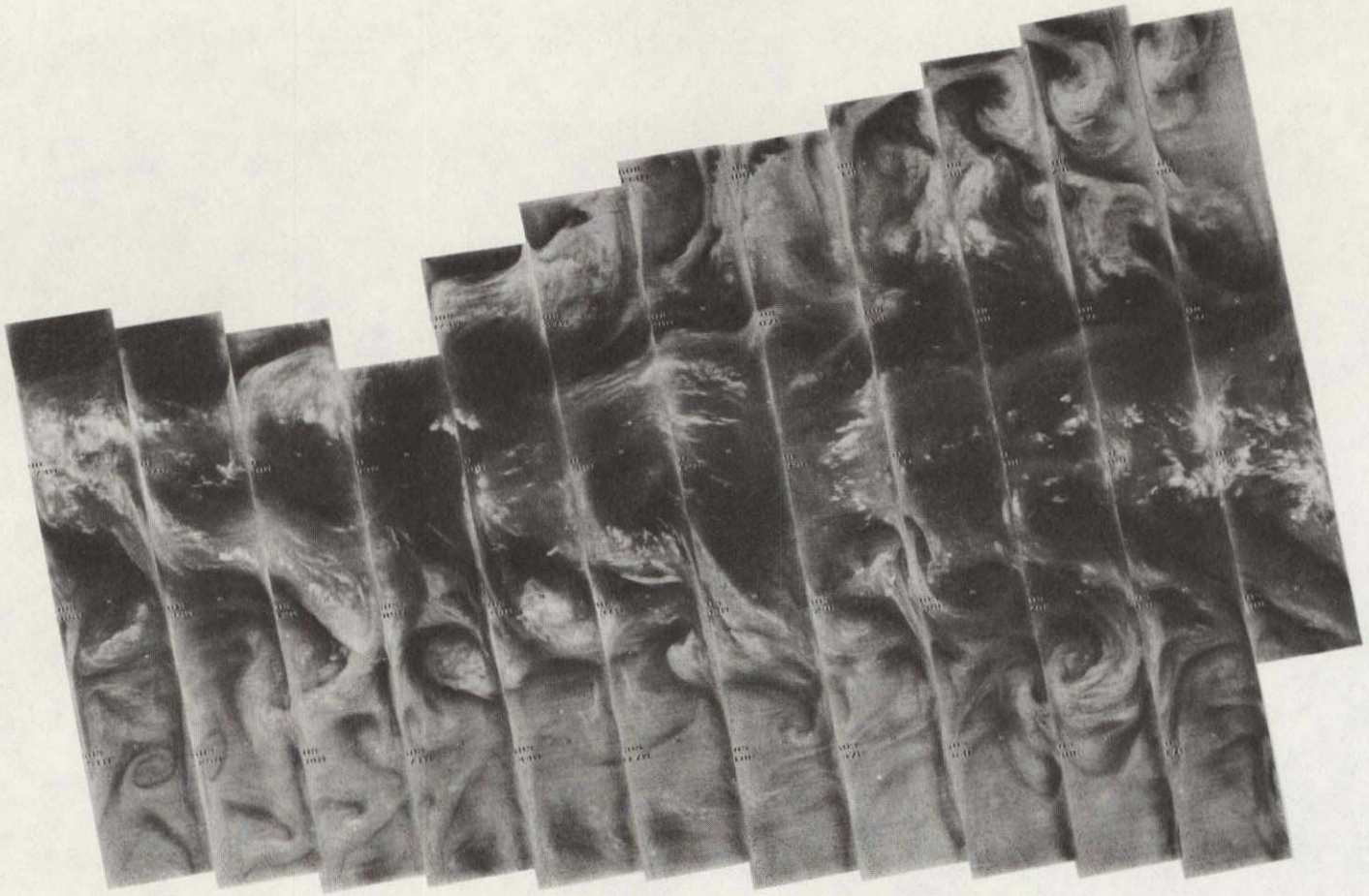
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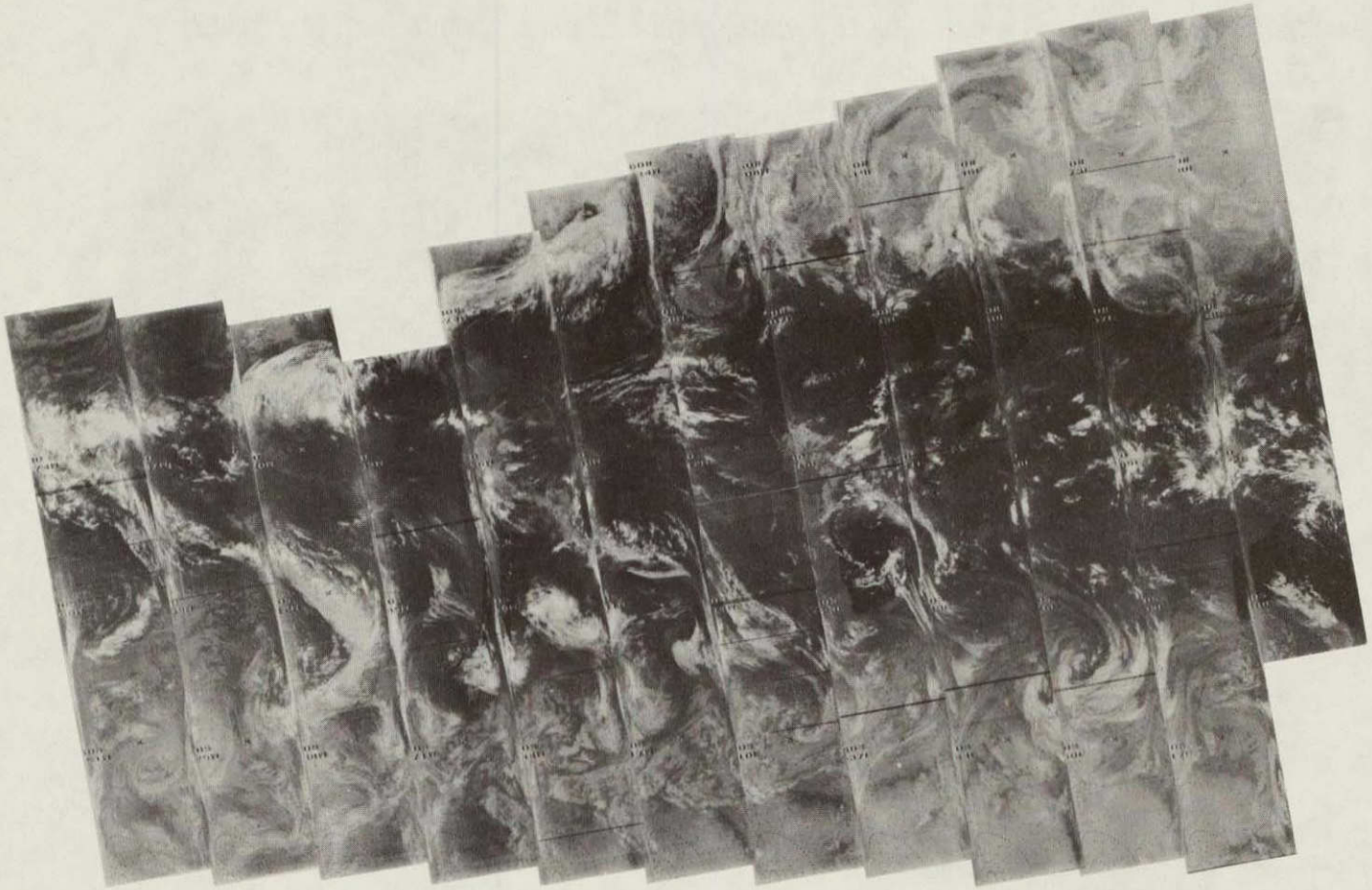
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7378 7377 7376 7375 7374 7373 7372 7371 7370 7369 7368 7367 7366

13 DEC 76

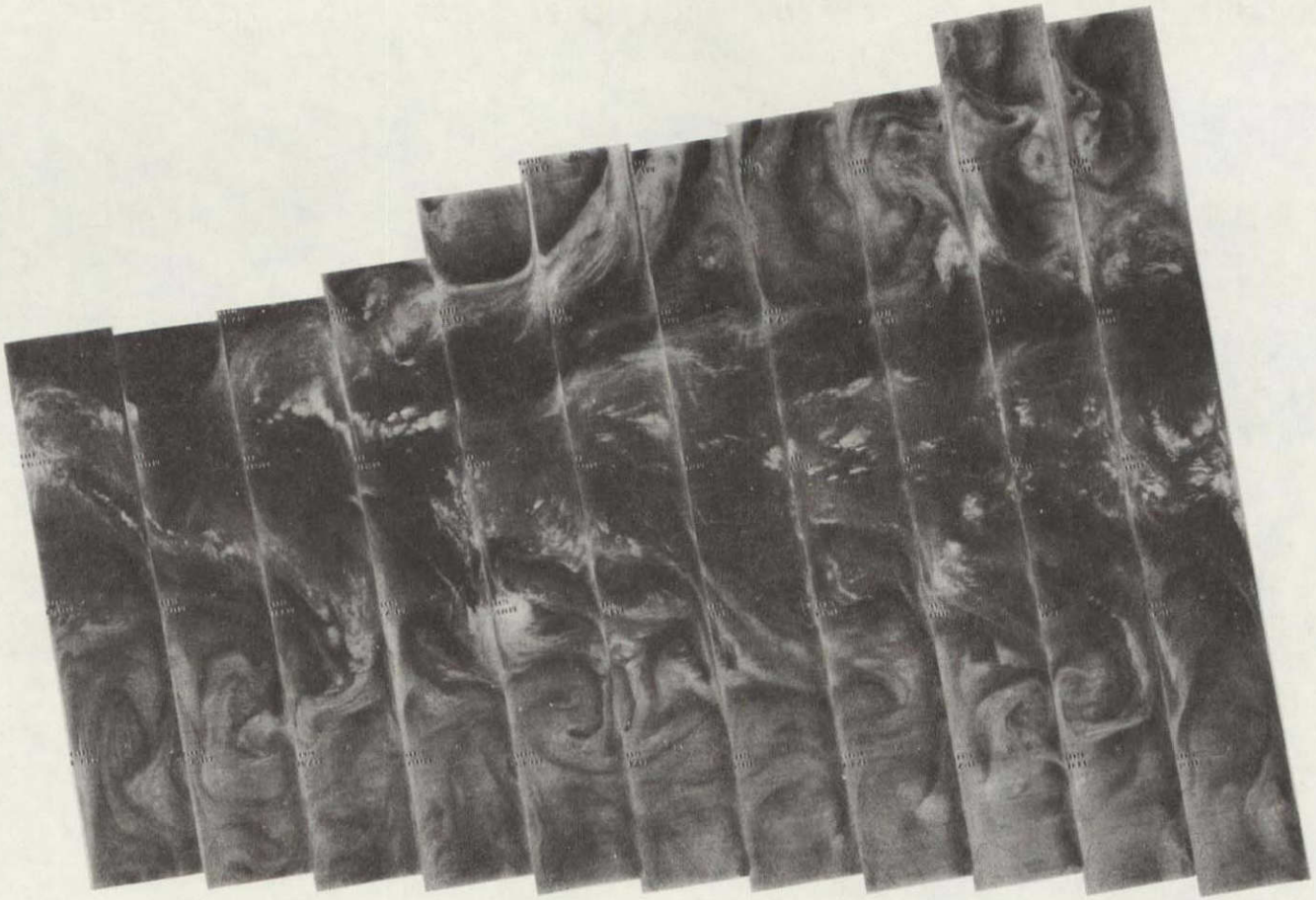
6.7μm



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13 DEC 76

11.5μm



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14 DEC 76

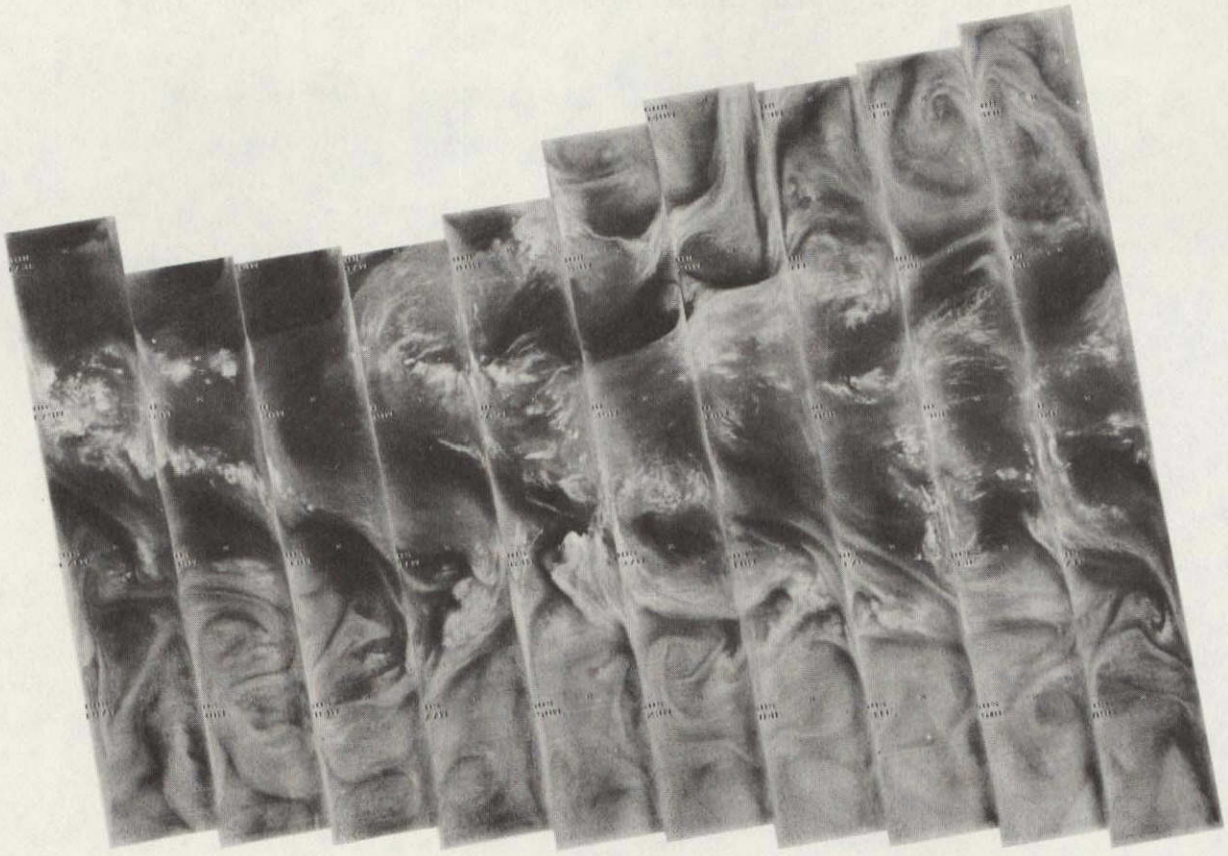
6.7μm



7391 7390 7389 7388 7387 7386 7385 7384 7383 7382 7381 7380 7379

14 DEC 76

11.5μm



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15 DEC 76

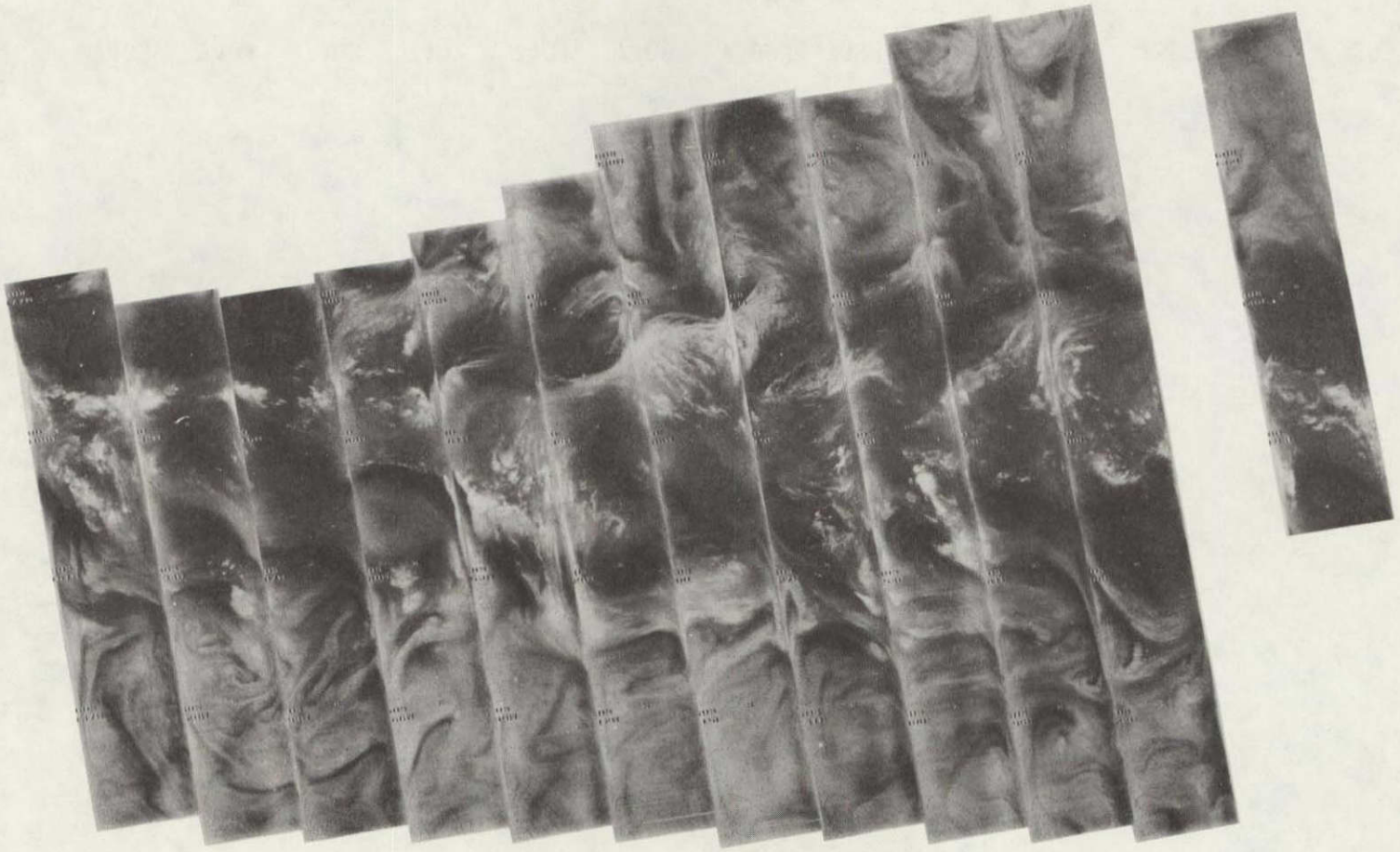
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15 DEC 76

11.5μm

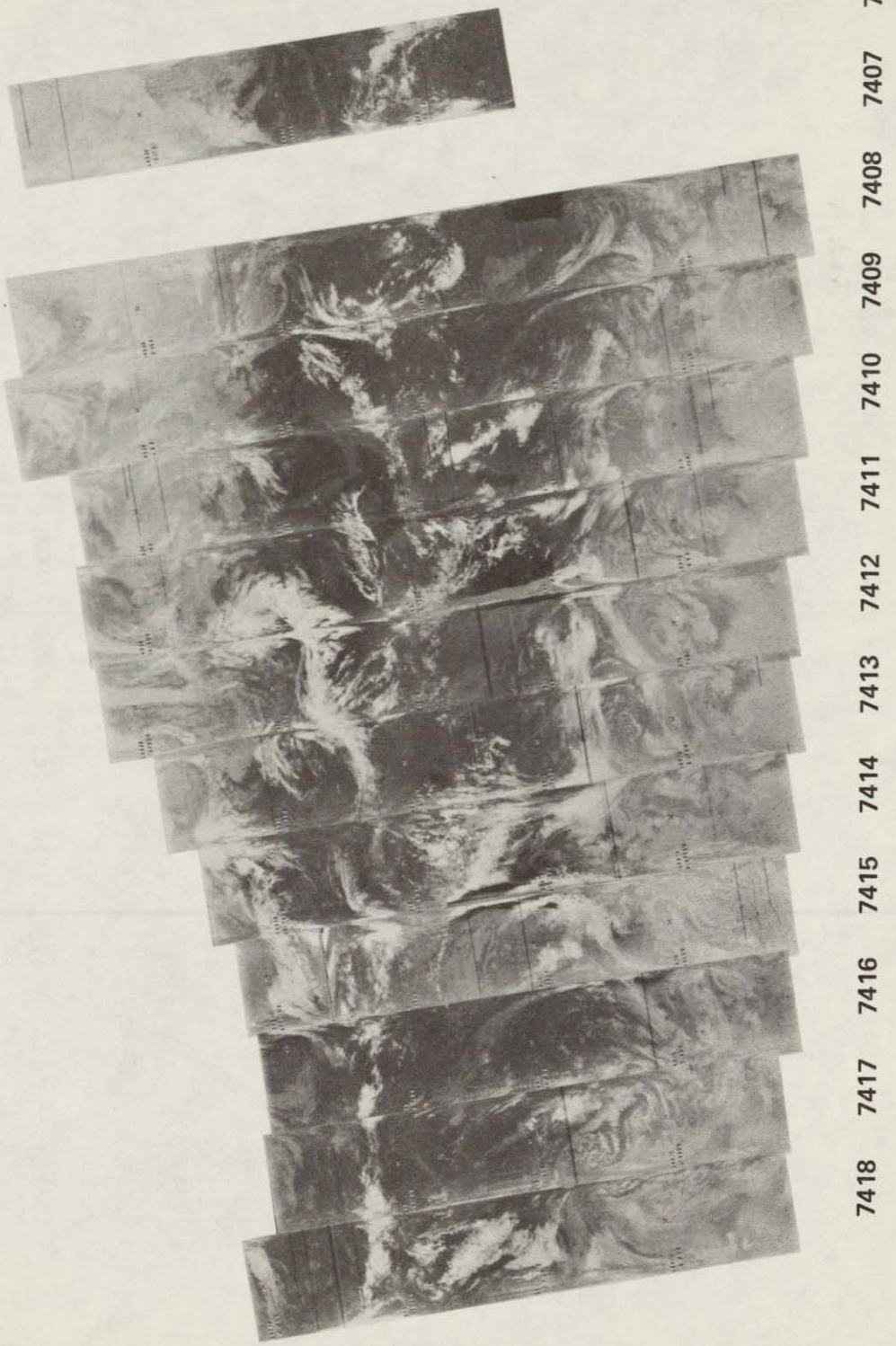
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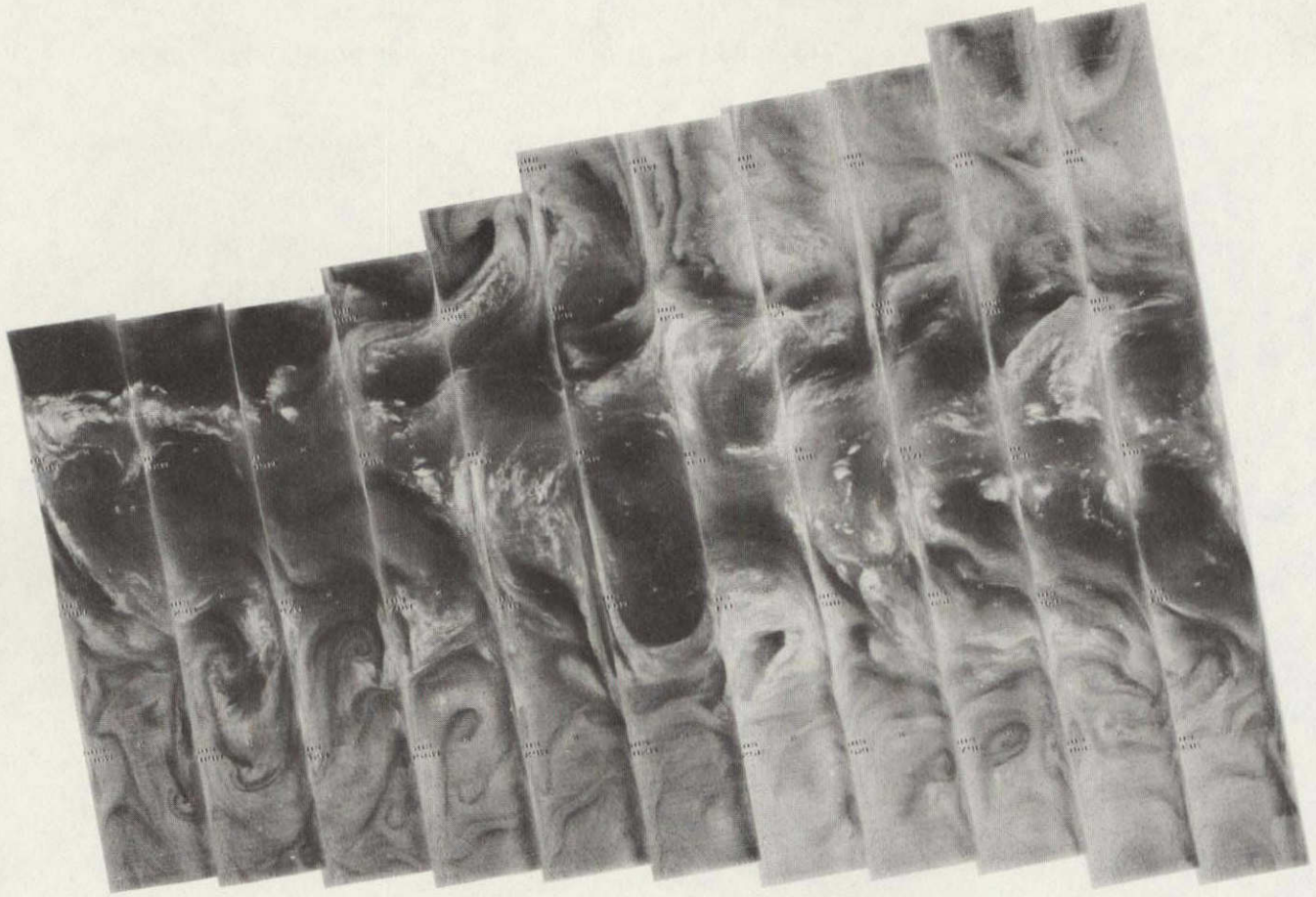
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16 DEC 76

6.7μm



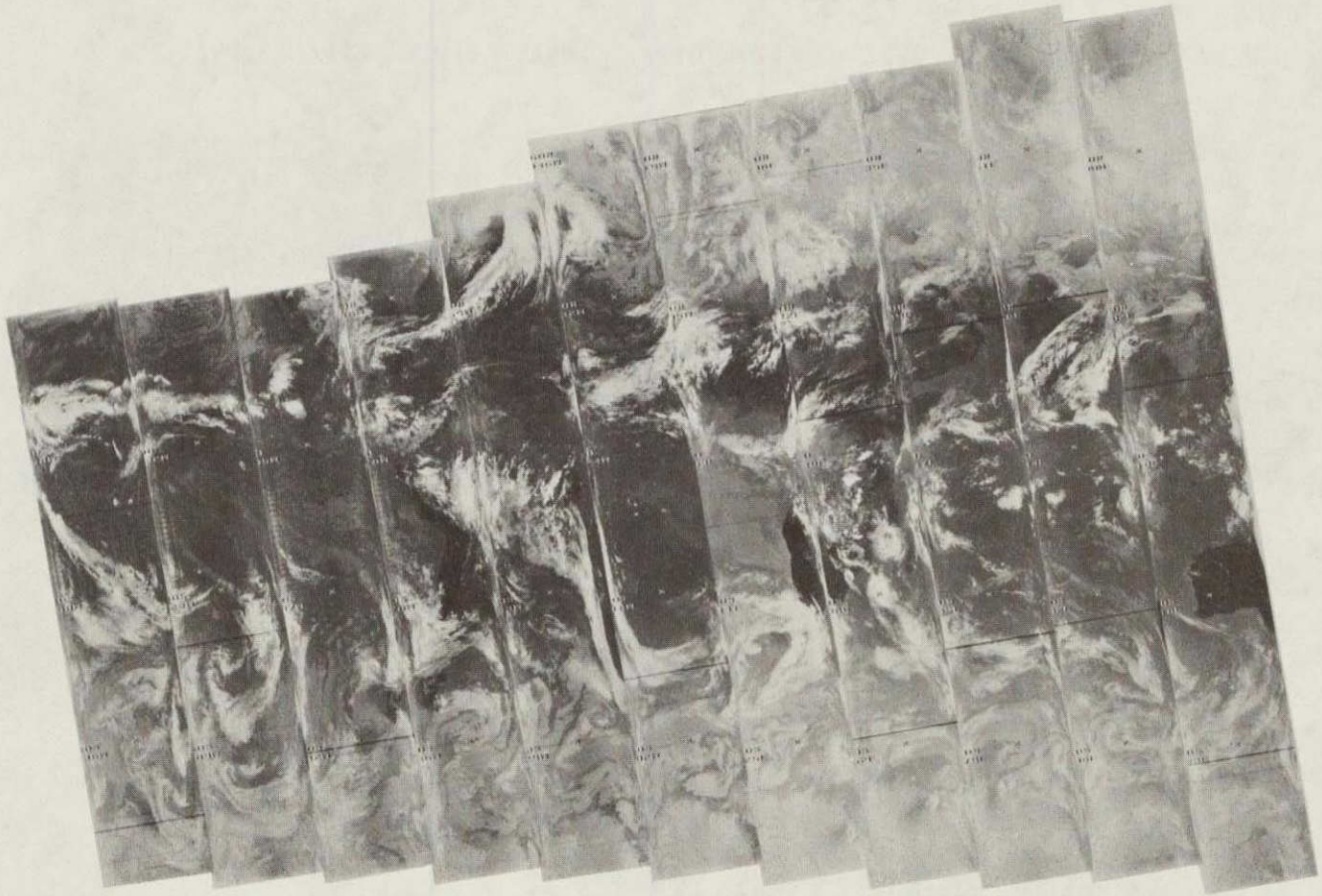
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7431 7430 7429 7428 7427 7426 7425 7424 7423 7422 7421 7420 7419

17 DEC 76

6.7μm



7431 7430 7429 7428 7427 7426 7425 7424 7423 7422 7421 7420 7419

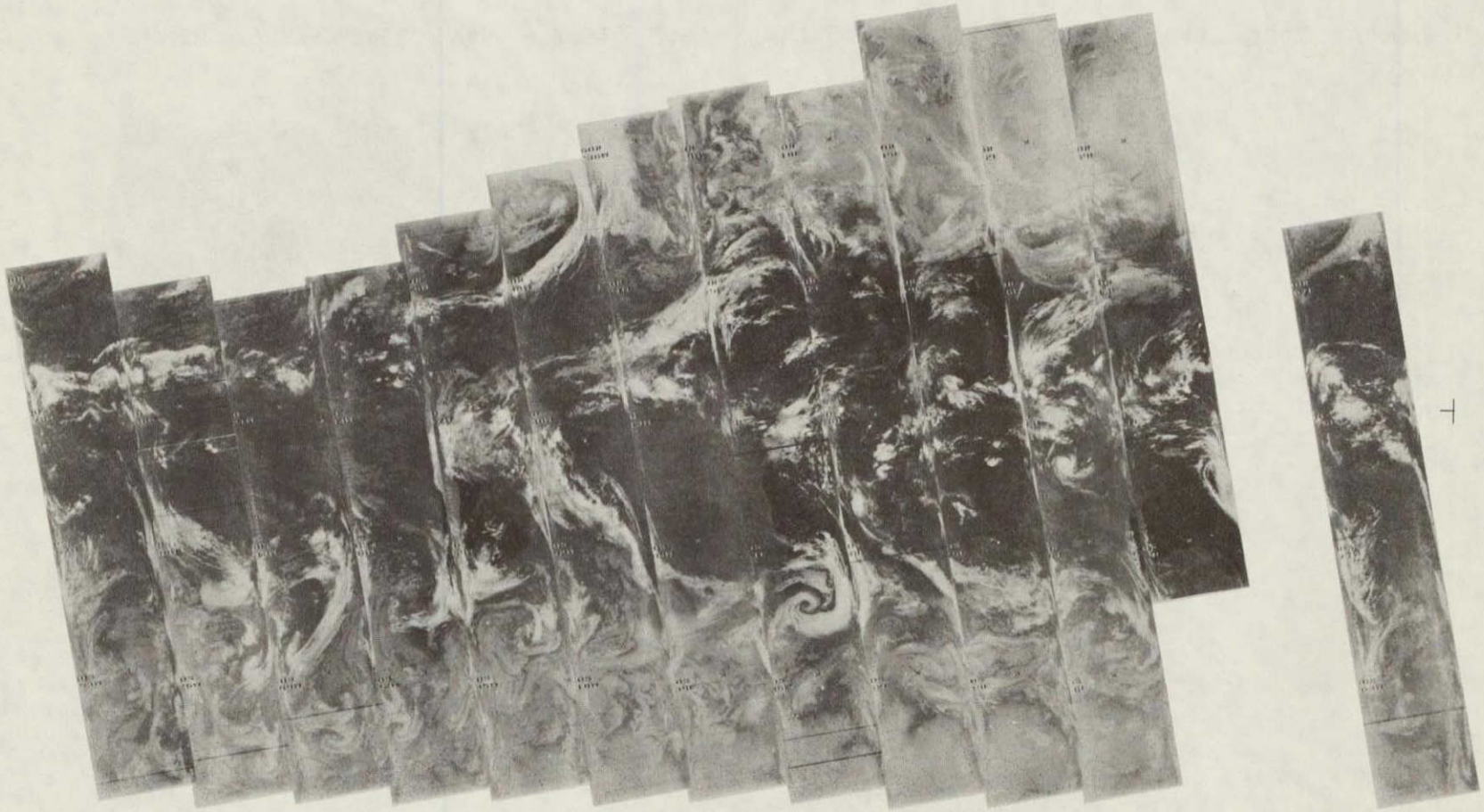
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11.5μm

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18 DEC 76

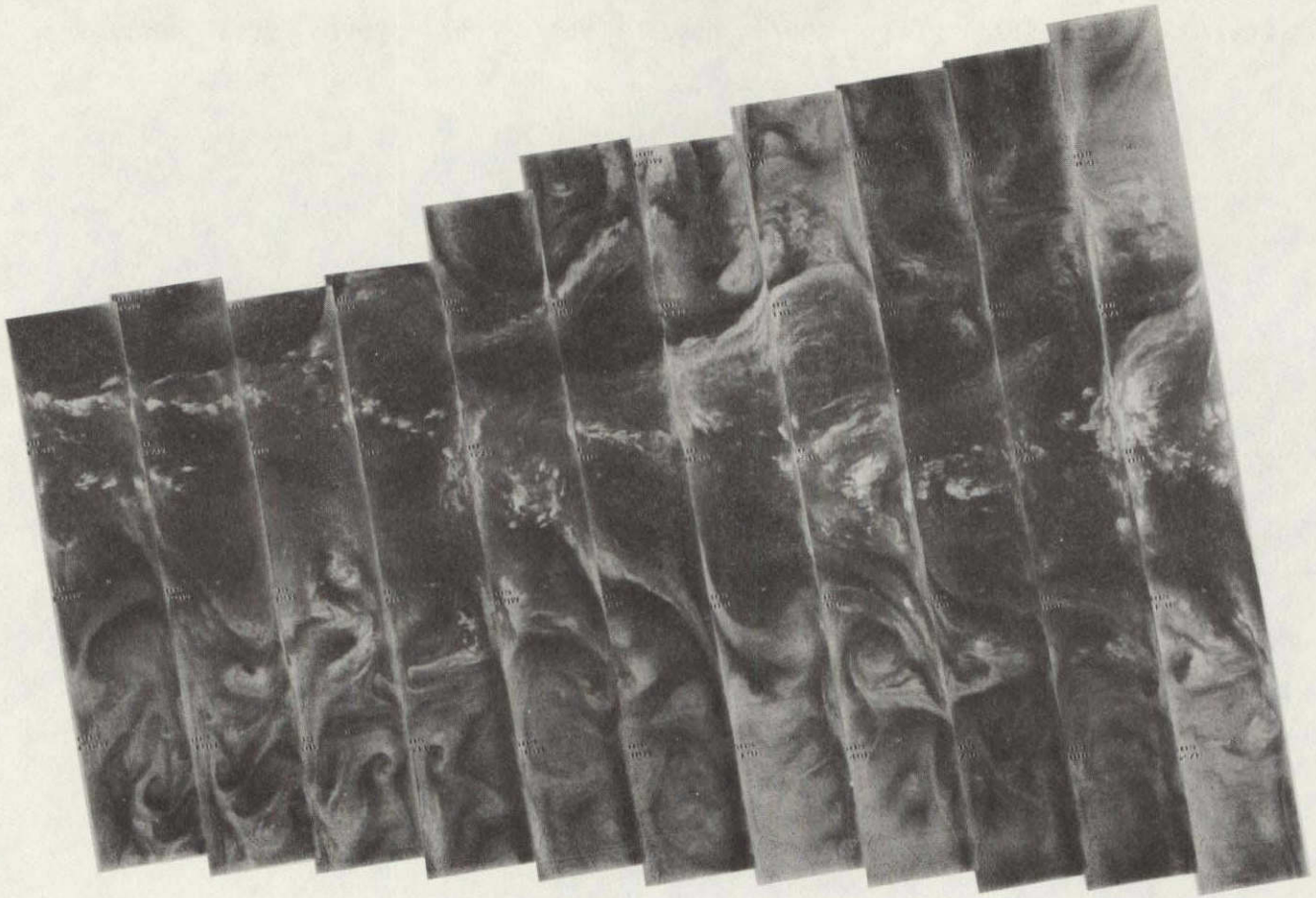
6.7μm



7445 7444 7443 7442 7441 7440 7439 7438 7437 7436 7435 7434 7433 7432

18 DEC 76

11.5μm



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19 DEC 76

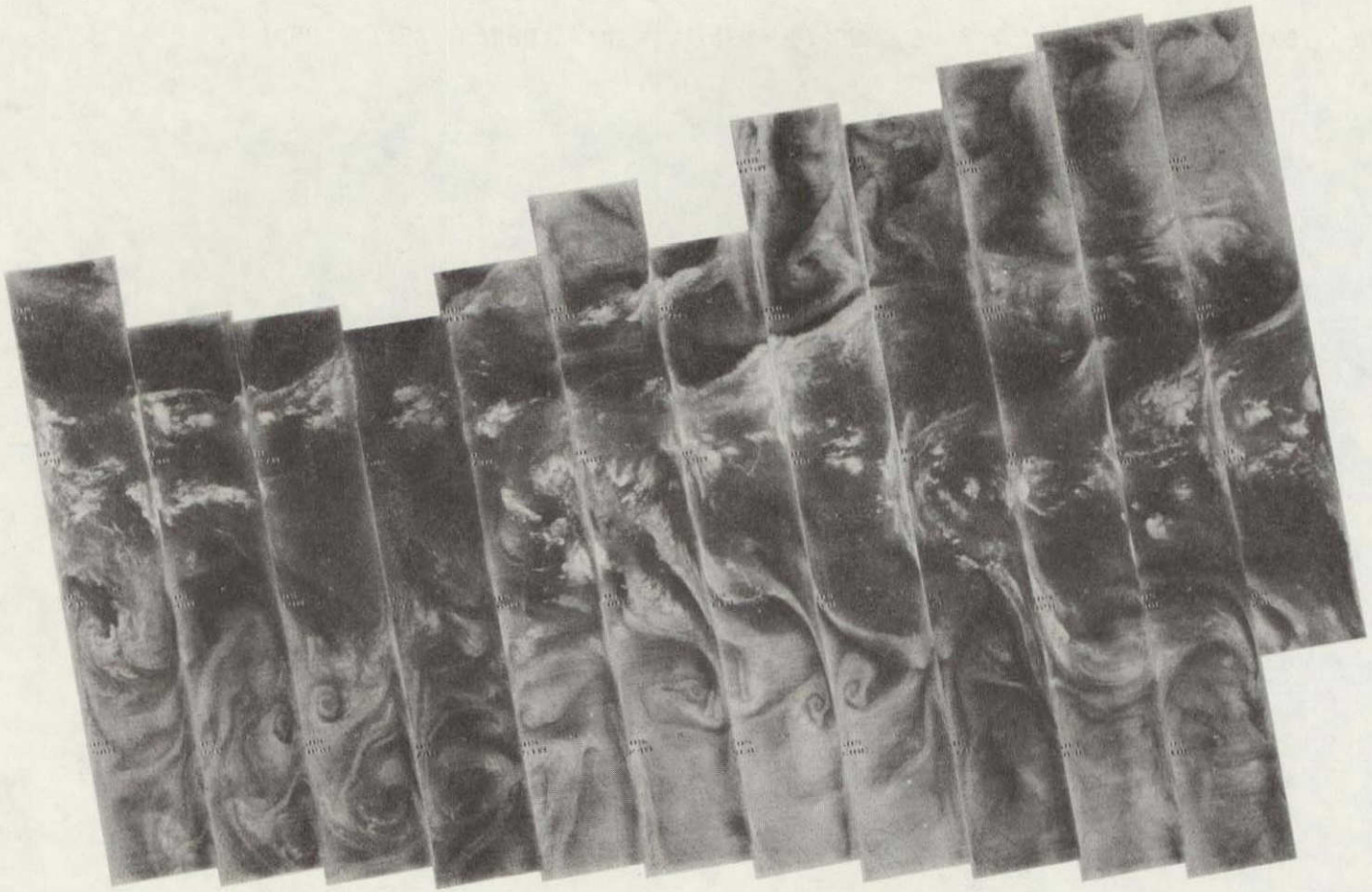
6.7μm

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19 DEC 76

11.5μm

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20 DEC 76

6.7μm

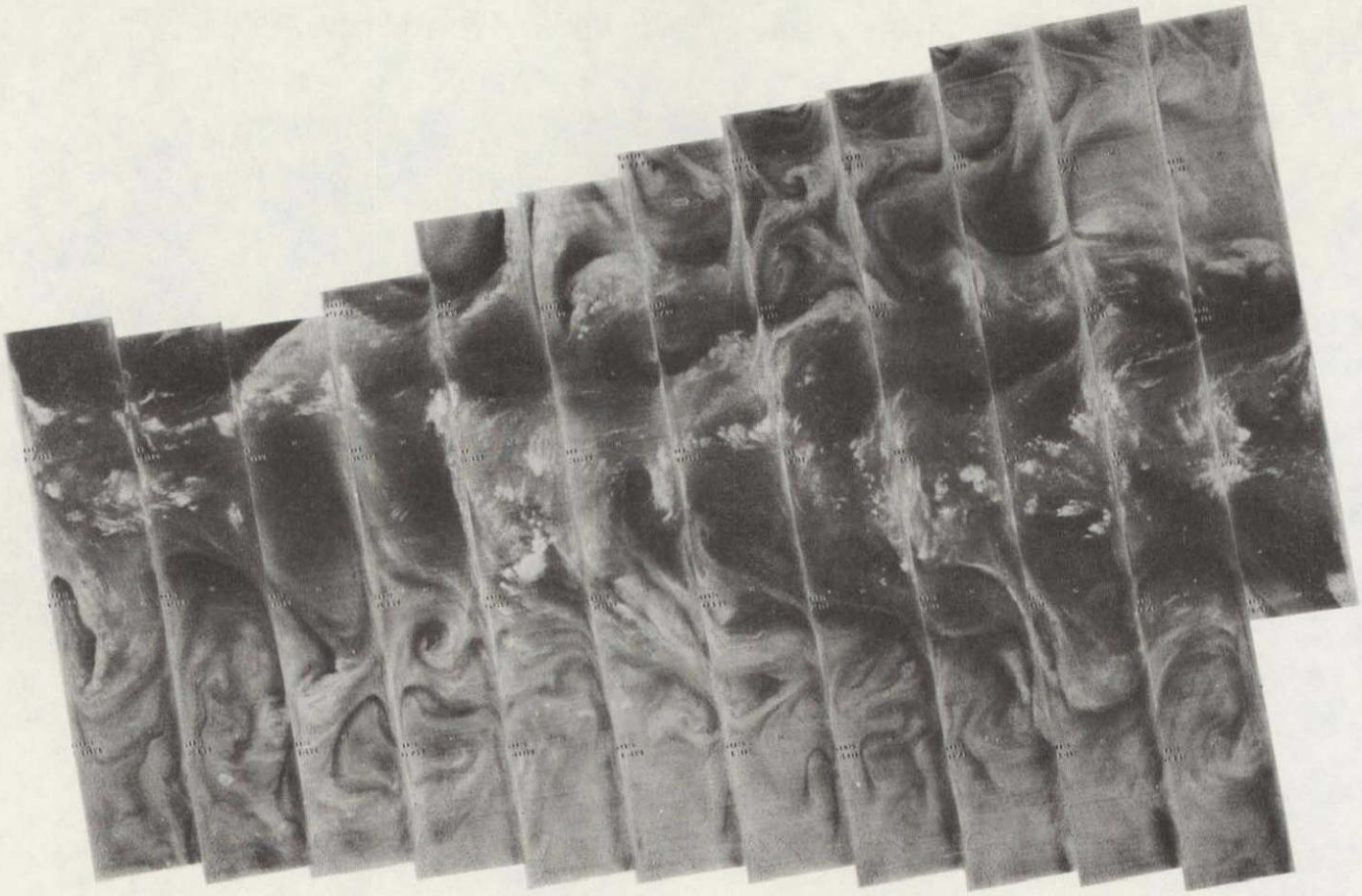
C-4

7472 7471 7470 7469 7468 7467 7466 7465 7464 7463 7462 7461 7460 7459

20 DEC 76

11.5μm

REPRODUCIBILITY OF THE ORIGINAL PAGE IS POOR



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21 DEC 76

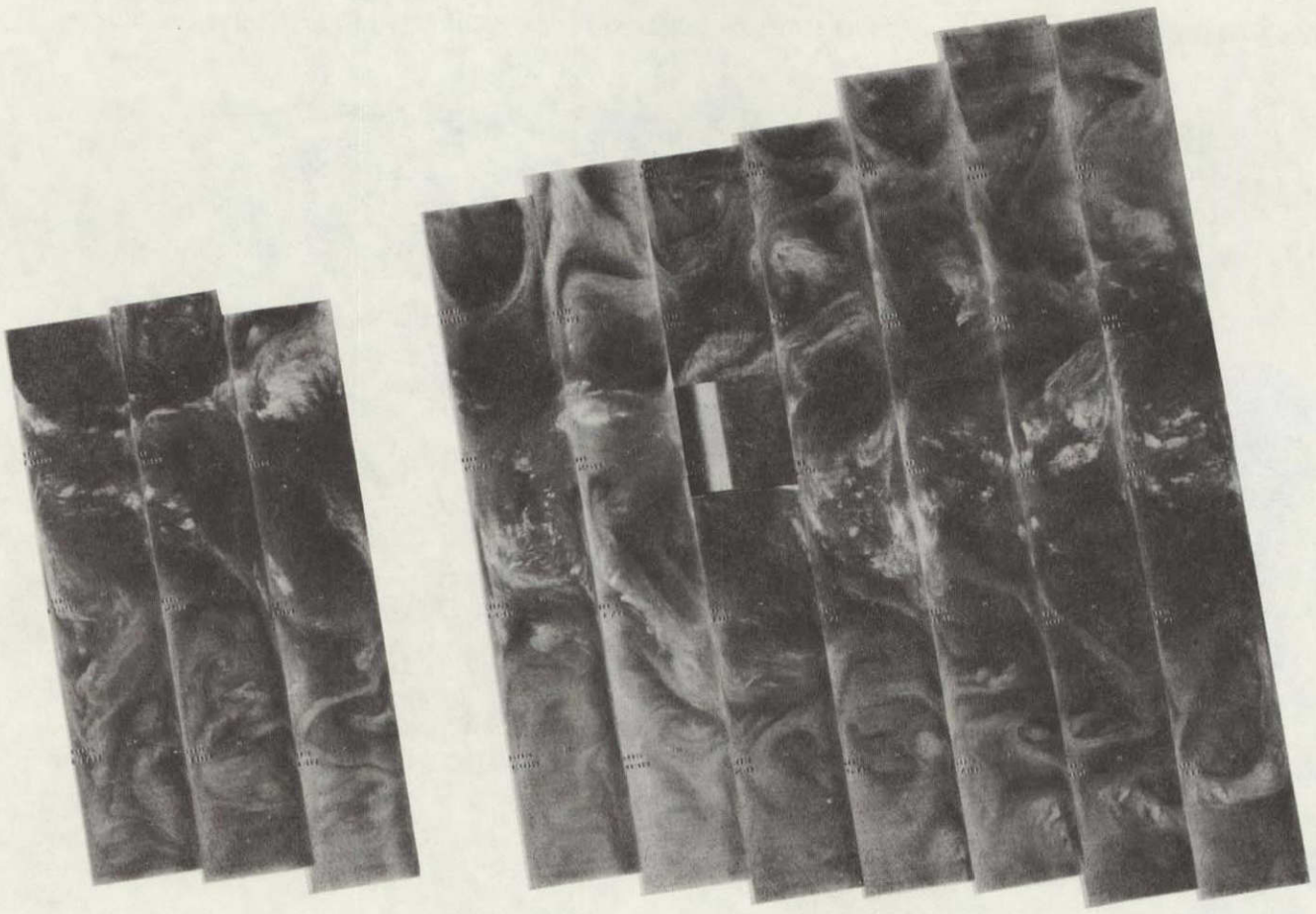
6.7μm



7485 7484 7483 7482 7481 7480 7479 7478 7477 7476 7475 7474 7473

21 DEC 76

11.5μm



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22 DEC 76

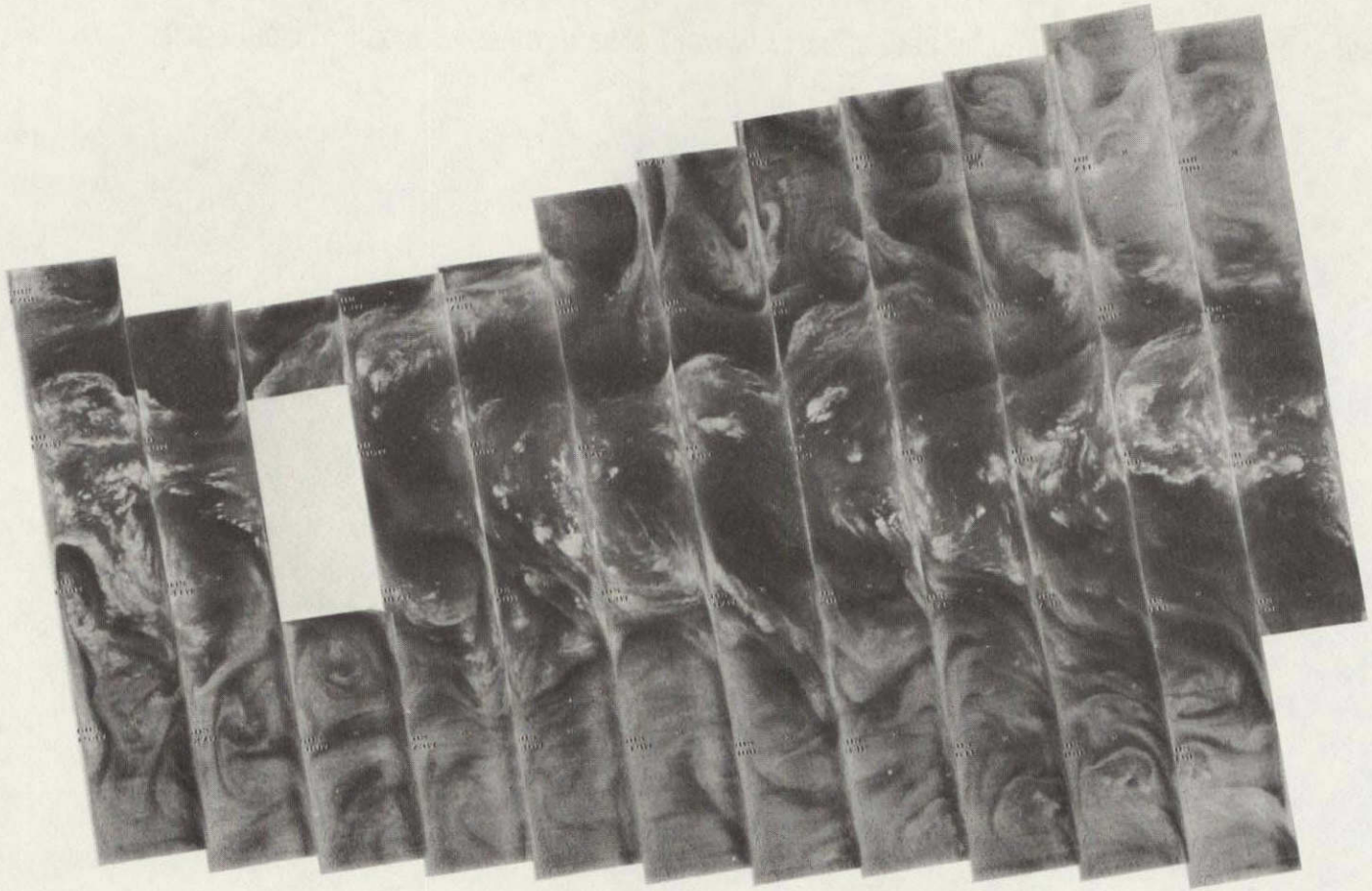
6.7μm

7498 7497 7496 7495 7494 7493 7492 7491 7490 7489 7488 7487 7486

22 DEC 76

11.5μm

REPRODUCIBILITY OF THE
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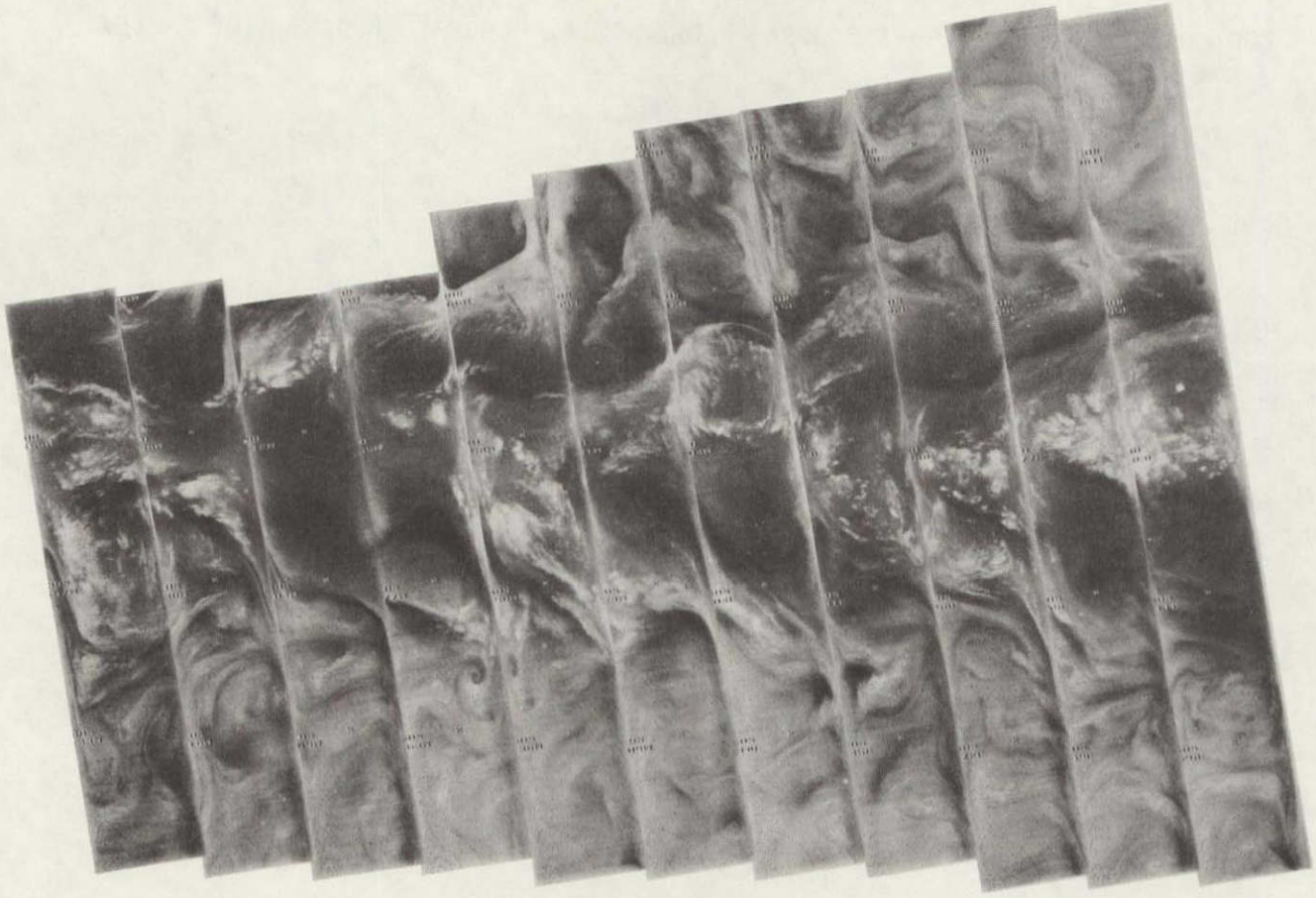
23 DEC 76

6.7μm

7512 7511 7510 7509 7508 7507 7506 7505 7504 7503 7502 7501 7500 7499

23 DEC 76

11.5μm



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24 DEC 76

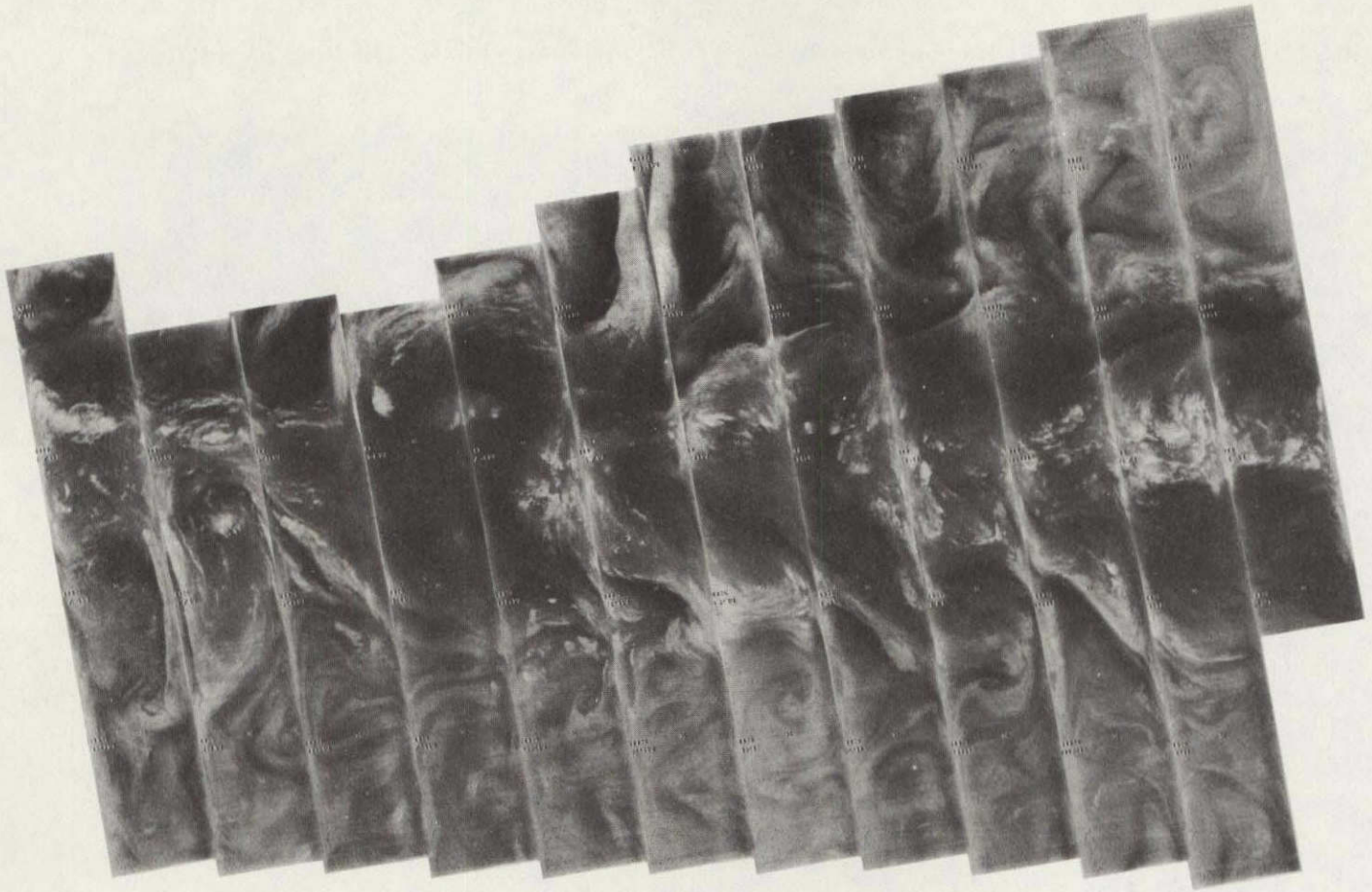
6.7μm



7525 7524 7523 7522 7521 7520 7519 7518 7517 7516 7515 7514 7413

24 DEC 76

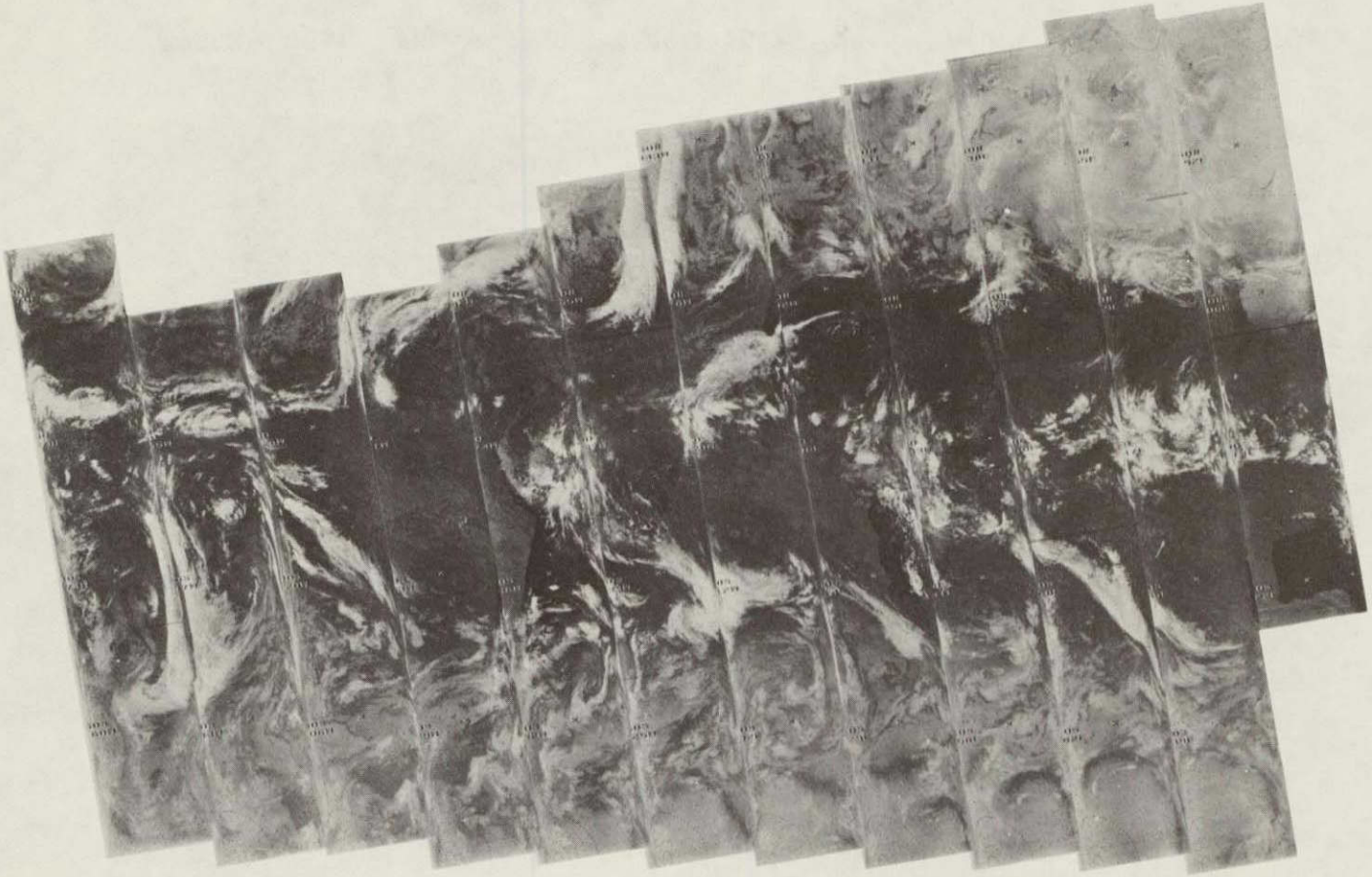
11.5μm



7539 7538 7537 7536 7535 7534 7533 7532 7531 7530 7529 7528 7527 7526

25 DEC 76

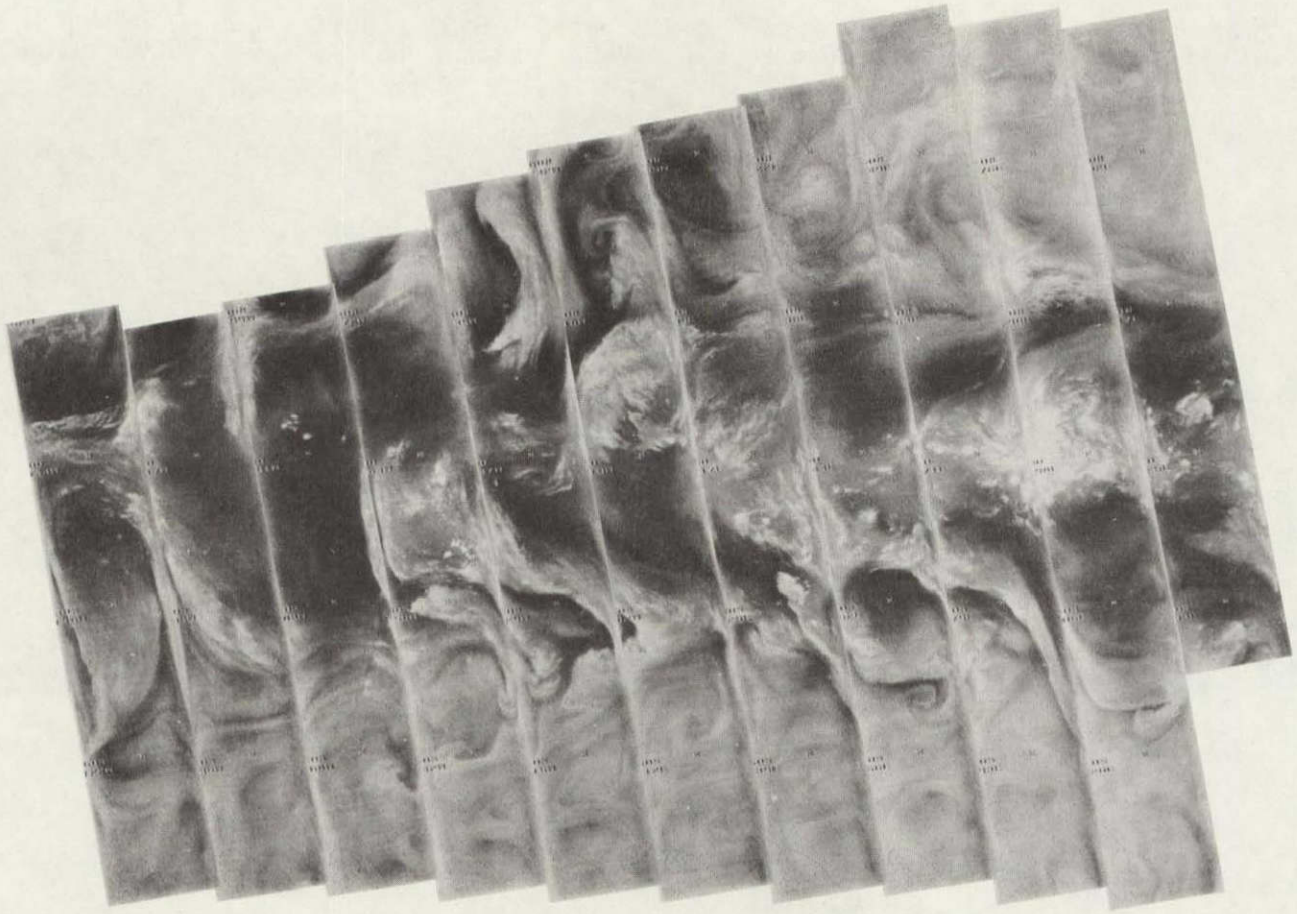
6.7μm



7539 7538 7537 7536 7535 7534 7533 7532 7531 7530 7529 7528 7527 7526

25 DEC 76

11.5μm



7552 7551 7550 7549 7548 7547 7546 7545 7544 7543 7542 7541 7540

26 DEC 76

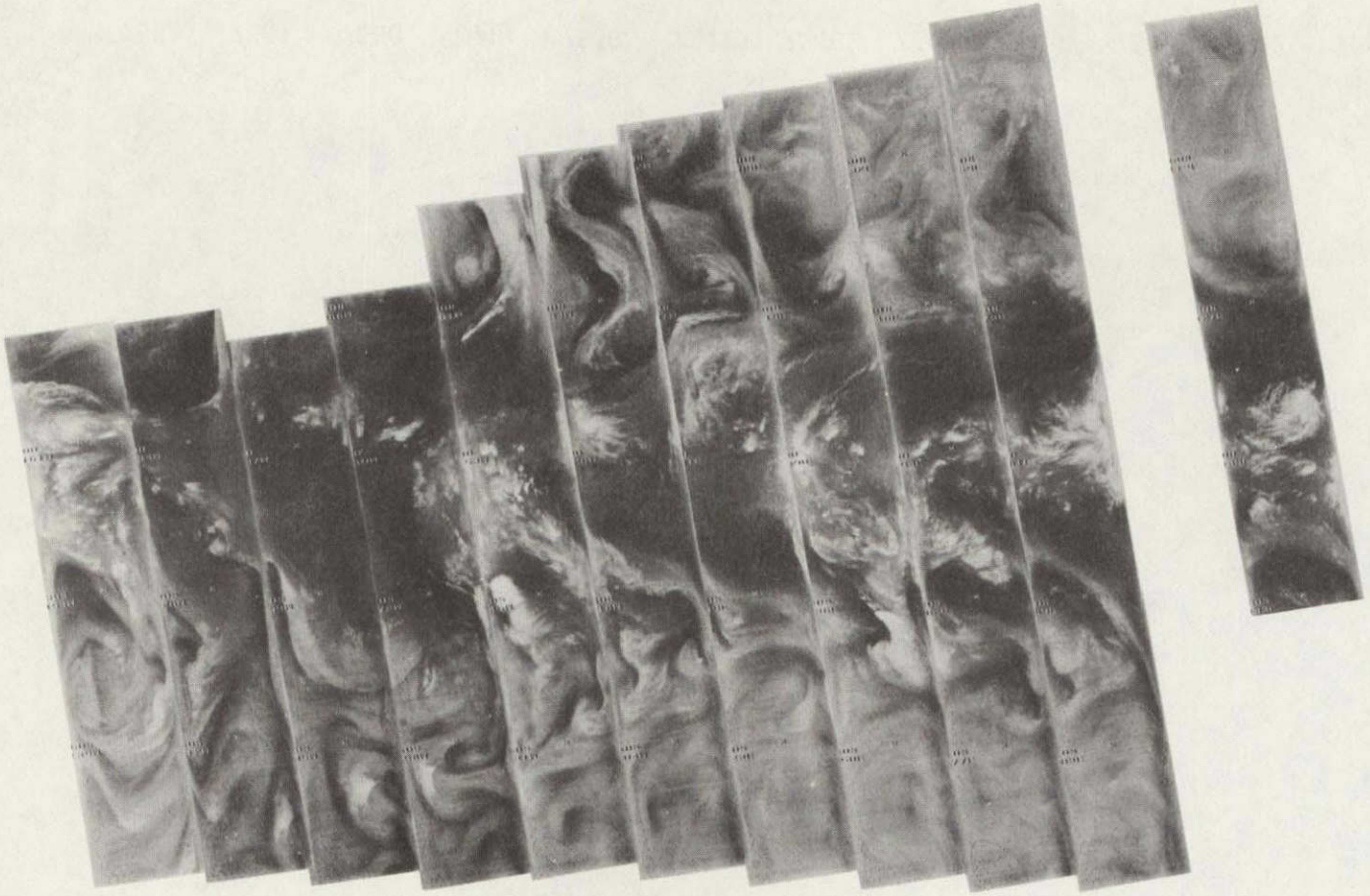
6.7μm

7552 7551 7550 7549 7548 7547 7546 7545 7544 7543 7542 7541 7540

26 DEC 76

11.5μm

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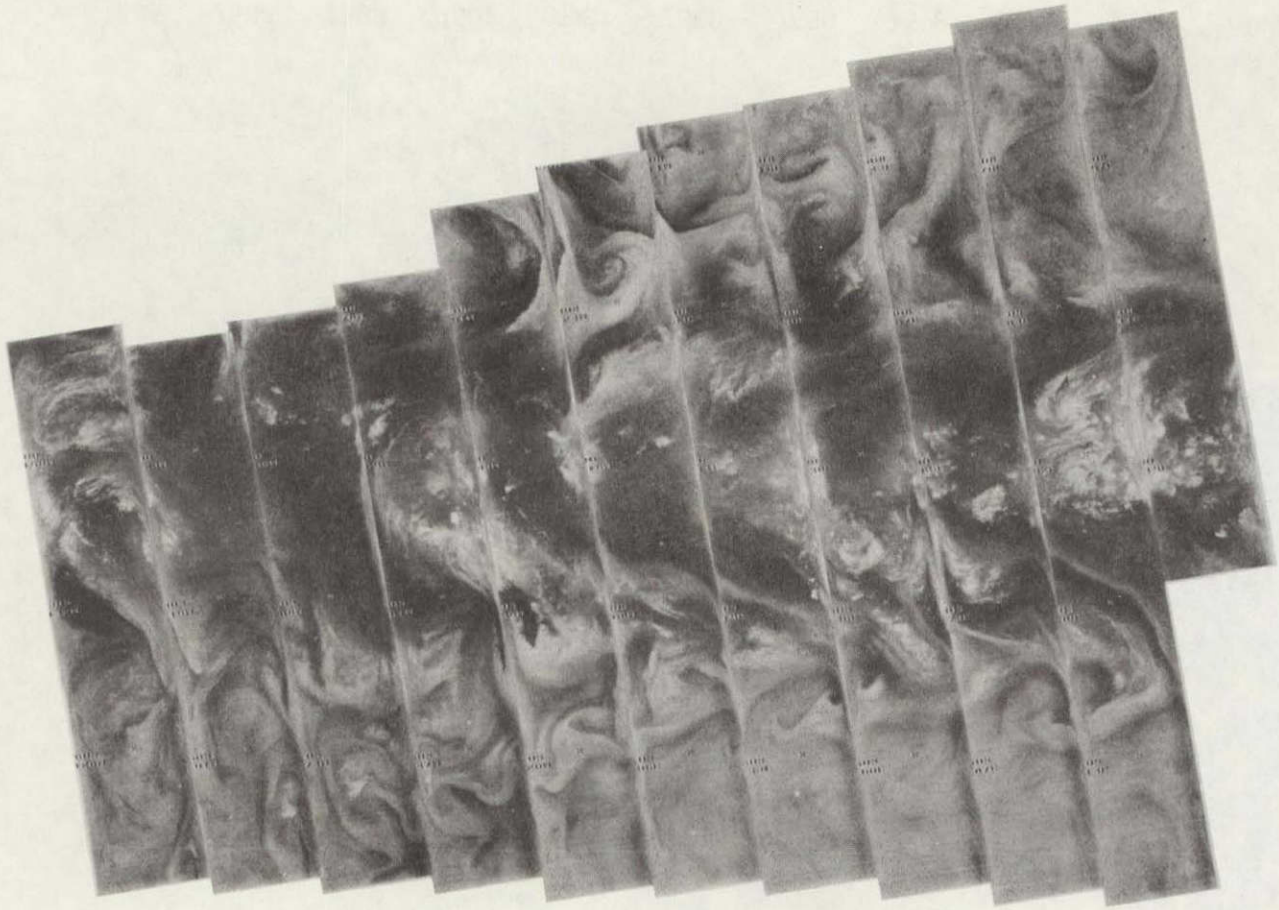


7565 7564 7563 7562 7561 7560 7559 7558 7557 7556 7555 7554 7553

27 DEC 76

6.7μm

REPRODUCIBILITY OF THE
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7579 7578 7577 7576 7575 7574 7573 7572 7571 7570 7569 7568 7567 7566

28 DEC 76

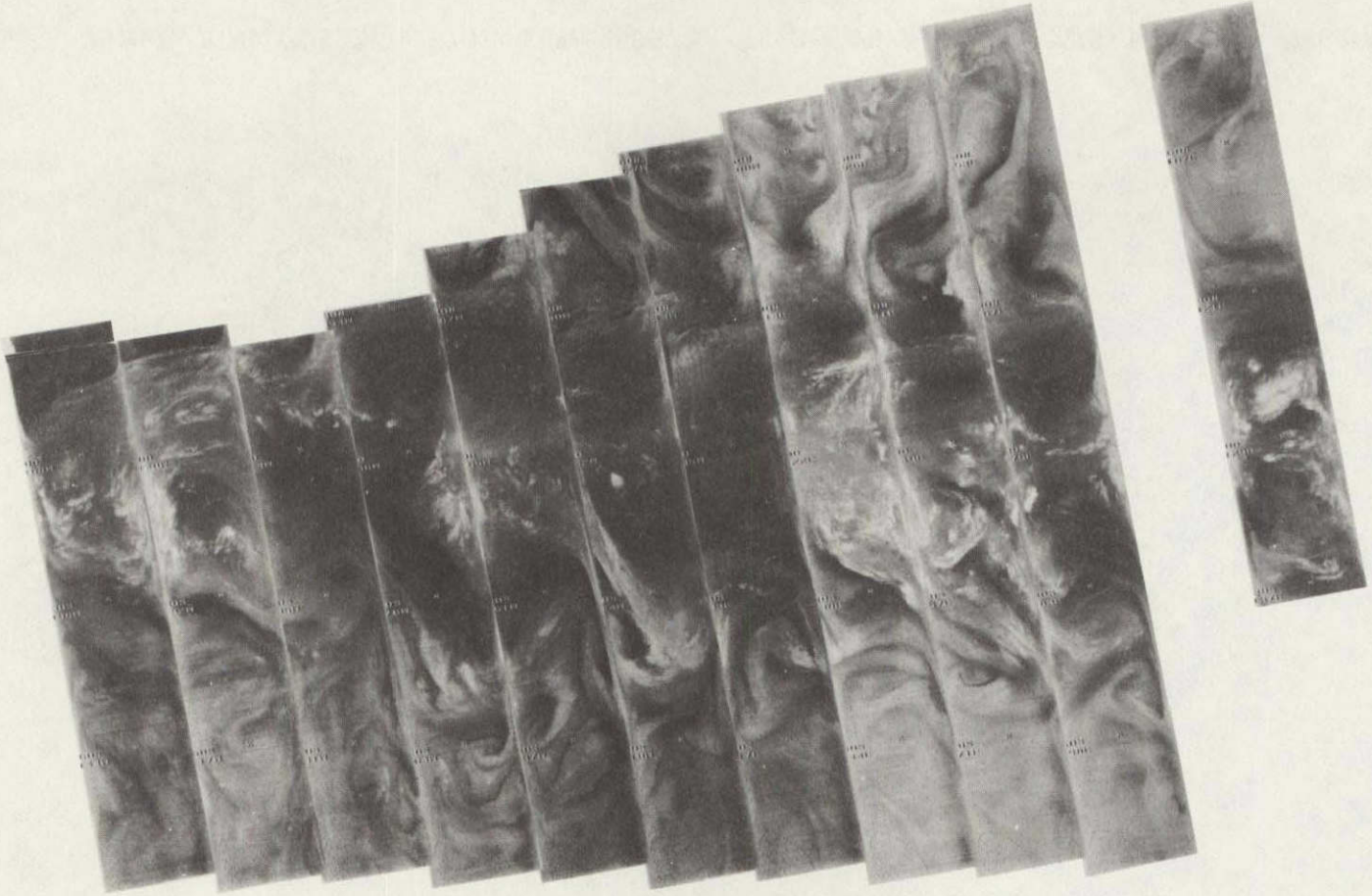
6.7μm

7579 7578 7577 7576 7575 7574 7573 7572 7571 7570 7569 7568 7567 7566

28 DEC 76

11.5μm

REPRODUCIBILITY OF THE
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7592 7591 7590 7589 7588 7587 7586 7585 7584 7583 7582 7581 7580

29 DEC 76

6.7μm

7592 7591 7590 7589 7588 7587 7586 7585 7584 7583 7582 7581 7580

29 DEC 76

11.5μm

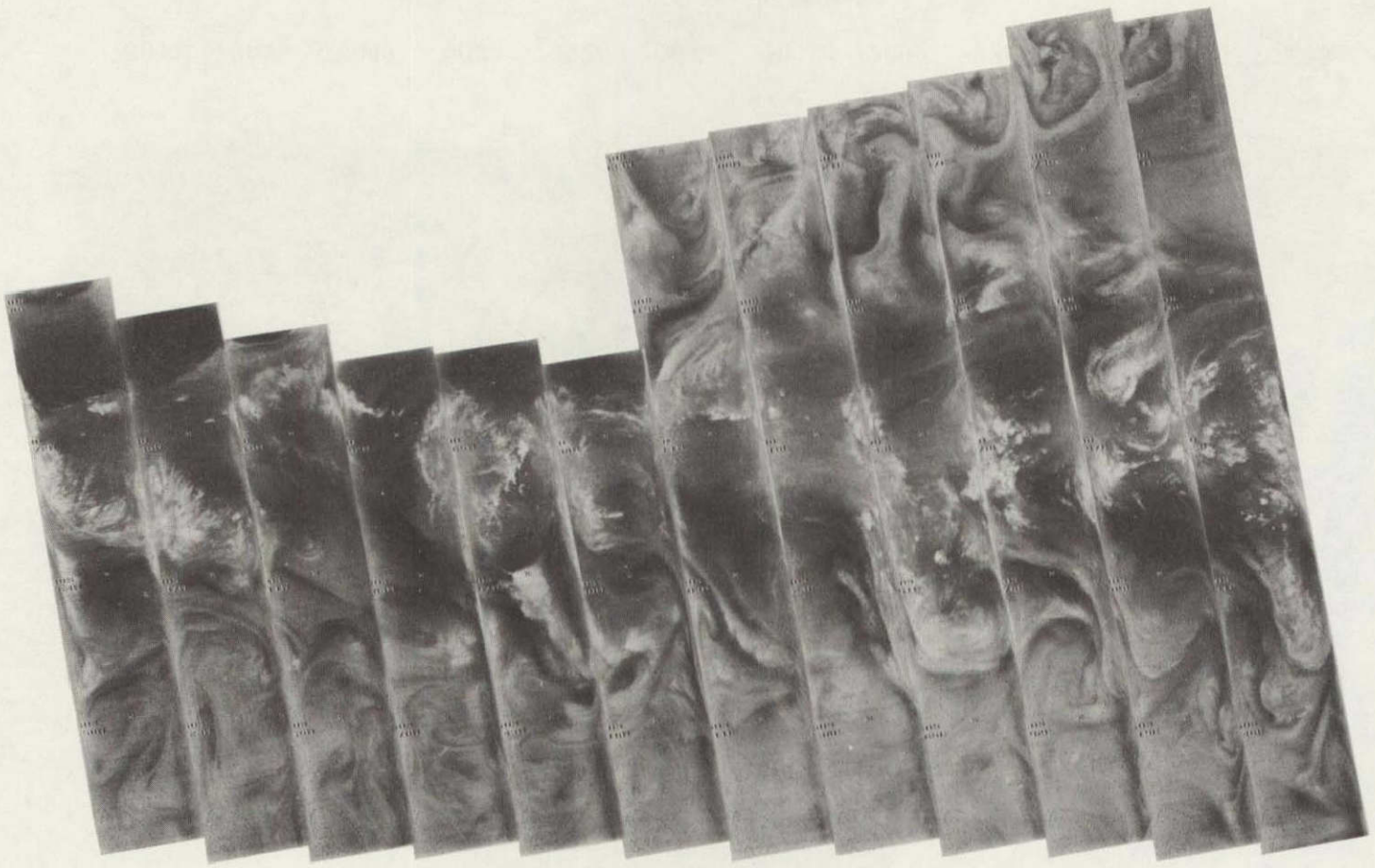
REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

7606 7605 7604 7603 7602 7601 7600 7599 7598 7597 7596 7595 7594 7593

30 DEC 76

6.7μm

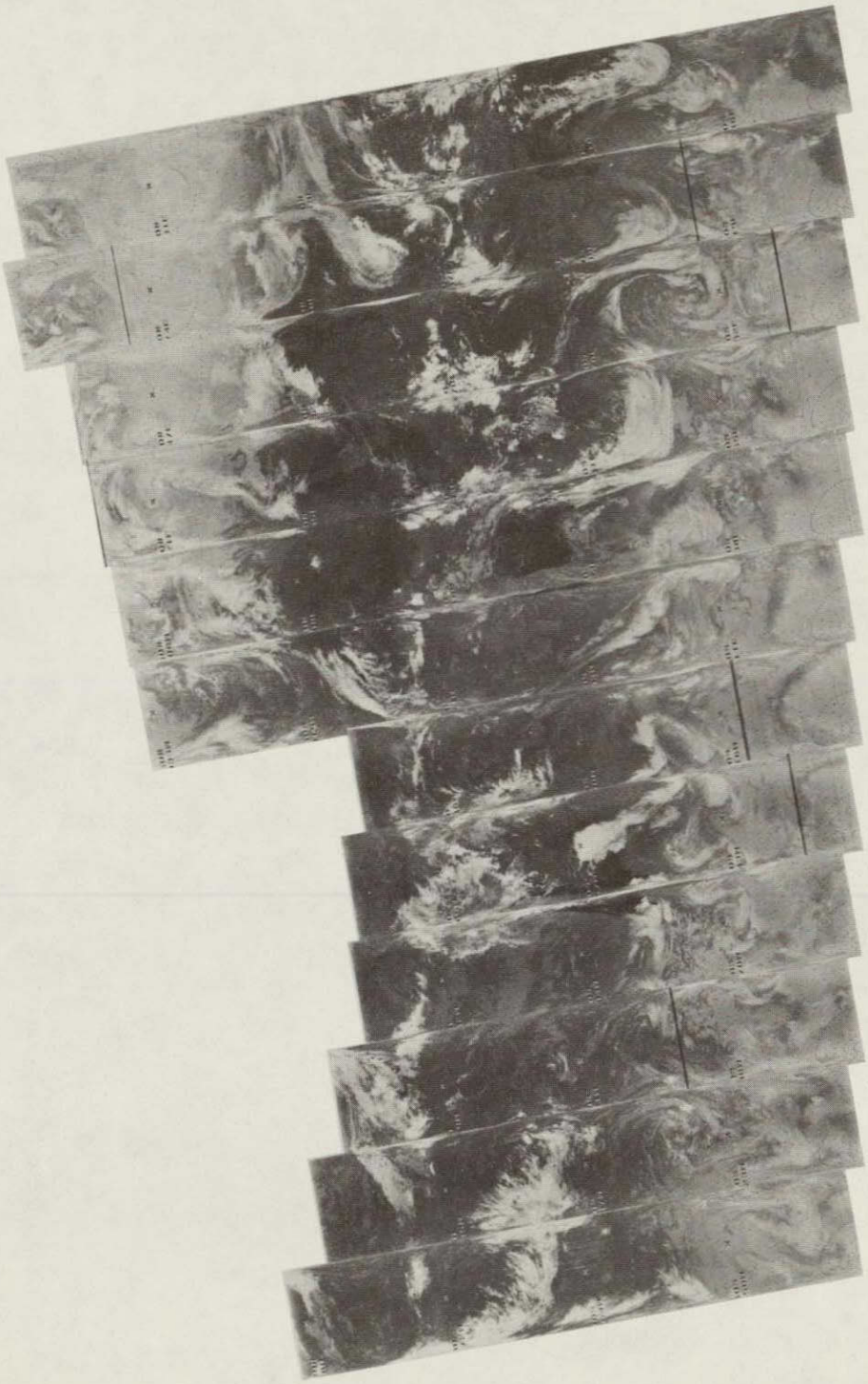
REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR



7619 7618 7617 7616 7615 7614 7613 7612 7611 7610 7609 7608 7607

31 DEC 76

6.7μm



REPRODUCIBILITY OF THE
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SECTION 5

CORRECTIONS TO THE NIMBUS 6 USER'S GUIDE

This section presents all corrections or additions to The Nimbus 6 User's Guide, which now are known to be necessary. If additional corrections are required, they will appear in a subsequent catalog. All corrections will be carried forward cumulatively into each new catalog.

5.1 THIR Corrections to the User's Guide

The THIR mirror on Nimbus 6 rotates counter clockwise. Therefore, replace lines one through four on page 14 with the following:

> ". . . rotation is such that, when combined with the velocity vector of the satellite, a left-hand spiral results. Therefore, the mirror scans across the earth from west to east in the daytime when traveling northward, and from east to west at night when traveling southward."

The information in Figure 2-4 on page 17 is correct. However, the direction of scan is counter clockwise, and not clockwise as shown.

5.2 HIRS Corrections to the User's Guide

On page 40, Table 3-2, under "Detector Summary" change LnSe to LnSb.

The CHANNEL (and) RANGE information in the swath displays for HIRS has been changed since launch, making Table 3-5 on pages 54 and 55 in the User's Guide incorrect. The table below labeled Table 5-1 provides the correct information.

5.3 SCAMS Corrections to the User's Guide

The information contents of the image in the swath displays for SCAMS has been changed since launch, making Tables 4-5, 4-6, and 4-7 in the User's Guide incorrect. Thus, the table below labeled Table 5-2 replaces Tables 4-5 and 4-6 in the User's Guide, and the table labeled 5-3 replaces Table 4-7 in the User's Guide. All the images display the same parameters. Therefore, these new tables do not list all the possible displays, as were listed in the old Tables 4-5, 4-6, and 4-7.

On page 44, Figure 3-3, the SCAMS elements are shown with a right-to-left (clockwise) stepping pattern when looking in the direction of satellite motion. The SCAMS elements should be corrected to show a left-to-right (counterclockwise) stepping pattern.

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Table 5-1
This table replaces Table 3-5 on pages 54 and 55 in The Nimbus 6 User's Guide

Table 3-5

Temperature Range of Gray Scale, and Channel of HIRS Data for each Swath on each HIRS Image Display Between Orbit 426 and 4697 (14 July 1975 through 27 May 1976)

		SWATH NUMBER									
		1	2	3	4	5	6	7	8	9	10
Coverage Period 14 July-20 July Orbits 426-513	HIRS Channel Display (channel-range)*	08-08	09-09	10-10	16-16	17-17	18-18	12-12	14-14	03-03	15-15
	Temperature Range (°K) (black to white)	300-200	290-210	260-210	310-270	100-900	0-30	290-210	260-210	240-210	280-210
Coverage Period 22 July-31 July Orbits 538-545 548-549 600-613 615-647 651-657 659	HIRS Channel Display (channel-range)*	08-08	09-09	10-10	16-16	17-17	17-17	12-12	14-14	03-03	15-15
	Temperature Range (°K) (black-white)	300-200	290-210	260-230	310-270	100-900	100-900	280-200	280-200	280-200	280-200
Coverage Period 23 July-6 Aug. Orbits 546-547 553-599 614 648-650 658 660-747	HIRS Channel Display (channel-range)*	08-08	16-16	16-21	18-18	17-17	10-10	12-12	14-14	03-03	15-15
	Temperature Range (°K) (black-white)	300-200	310-270	300-200	0-30	100-900	260-230	280-200	280-200	280-200	280-200

Table 3-5 (Continued)

		SWATH NUMBER									
		1	2	3	4	5	6	7	8	9	10
Coverage Period 7 Aug. - 27 May Orbits 748-4697	HIRS Channel Display (channel-range)*	08-08	16-16	16-21	18-18	17-17	10-10	12-12	14-14	03-03	15-15
	Temperature Range (°K) (black-white)	310-230	310-230	310-270	0-50	100-900	280-210	300-210	300-210 **	240-185	300-185 ***

*The HIRS channel number is number before the hyphen. The number after the hyphen is the computer program table used to display the data from each channel as temperatures (°K) The range of temperatures displayed in each swath is given beneath each "HIRS Channel Display." The 18 steps of the scale are used to represent the division of each temperature range into 18 approximately equal temperature intervals. The central wavelength (in μm) of each channel on these displays is channel 3 = 14.4, 8 = 11.0, 9 = 8.2, 10 = 6.7, 12 = 4.52, 14 = 4.40, 15 = 4.24, 16 = 3.71, 17 = 0.61, and 18 is the temperature difference between channel 16 and channel 8. The values of channel 17-17 are albedo, represented as "counts" between 100 (blackest) and 900 (whitest). The values for 16-21 represent a second temperature range for channel 16 data Table 3-1 on page 39 of the User's Guide provides detailed spectral information and the purpose of each of the HIRS channels.

**14-14 temperature range changed to 270-210 on orbit 3166A (26 January 1976)

***15-15 temperature range changed to 275-210 on orbit 3166A (26 January 1976)

Table 5-2

This table replaces Tables 4-5 and 4-6 (on pages 79 through 81) in the Nimbus 6 User's Guide and Table 5-2 in the Nimbus 6 Data Catalog Volume 4

Table 4-5 and 6

Parameter Limits of the Gray Scale for Parameters 1, 2, 3, 5, 11, 12, and 16 on the SCAMS Image Displays between Orbits 426 and 4751 (14 July 1975 and 31 May 1976)

	Swath		1	2	3	4	5
Orbits 426 thru 1425 14 July 75 thru 26 Sept. 75	Parameter		3	2	16	11	12
	Gray Scale Value	black	280 °K	320 °K	10 °K	60 g/mm^2	1.5 g/mm^2
		white	210	100	-22	0.0	-0.1*
Orbits 1426 thru 3675 26 Sept. 75 thru 12 Mar. 76	Parameter		3	2	16	11	12
	Gray Scale Value	black	280 °K	320 °K	10 °K	60 g/mm^2	2.0 g/mm^2
		white	210	100	-22	0.0	0.0
Orbits 3676 thru 3899 12 Mar. 76 thru 29 Mar. 76	Parameter		5	2	16	11	12
	Gray Scale Value	black	240 °K	320 °K	10 °K	70 g/mm^2	2.0 g/mm^2
		white	200	100	-22	0.0	0.0
Orbits 3900 thru 3929 29 Mar. 76 thru 31 Mar. 76	Parameter		1	1	1	5	5
	Gray Scale Value	black	220 °K	265 °K	300 °K	240 °K	280 °K
		white	130	210	260	200	220
Orbits 3930 thru 4584 31 Mar. 76 thru 19 May 76	Parameter		1	1	1	2	3
	Gray Scale Value	black	220 °K	265 °K	300 °K	320 °K	280 °K
		white	130	210	260	100	220
Orbits 4585 thru 4751 19 May 76 thru 31 May 76	Parameter		1	1	1	5	3
	Gray Scale Value	black	220 °K	260 °K	290 °K	240 °K	280 °K
		white	130	200	245	180	220

*1.6 to 0.0 between orbit 426 and 477

Parameters 1, 2, 3, 5, and 16 represent uninverted antenna temperatures for channels 1 (22.24 GHz), 2 (31.65 GHz), 3 (52.85 GHz), and 5 (55.45 GHz). Parameter 16 is the temperature difference between channels 2 and 3. Parameters 11 and 12 represent inverted antenna temperatures of integrated atmospheric water vapor (channel 11) and integrated liquid water from clouds or precipitation.

Table 5-3

This table replaces Table 4-7 (on pages 82 and 83) in The Nimbus 6 User's Guide

Table 4-7

Contour Program Options used for Parameters 13, 14, and 15
on the SCAMS Image Display

Contour options	Parameters			Valid for orbits
	13 Mean temperature between 1000 mb and 500 mb	14 Mean temperature between 500 mb and 250 mb	15 Mean temperature between 250 mb and 100 mb	
Contour interval	4°K	4°K	4°K	426-851 (14 July- 14 Aug. 1975)
Contour thickness	1°K	1°K	1°K	
Contour interval	4°K	4°K	4°K	852-4751 (14 Aug.-1975- 31 May 1976)
Contour thickness	2°K	2°K	2°K	

Section 4.5.3 "Tape Format" on page 83 of the User's Guide states that each tape will have "five files, i.e., a short header file. . . and four data files, . . ." There will not be a header file on the archival tape. The sentence should be changed to read: "The tapes will be standard 9-track 1600 BPI tapes, each containing four data files, one for each of four days."

In Table 4-8 on page 80 the "Pitch error" and "Roll error" "Dimensional Units" should be changed to counts (from Deg) and the "Multiplier Used" should be changed to 1 (from 32). In the same table the "Playback orbit" should be followed by one "I*2 Spare", and then by the "Reference orbit", which should be changed to I*4 (rather than I*2). (Reference orbit = year * 100,00 + day * 100 + finish hour.) The "Dimensional Units" for the "Geopotential thicknesses" on page 85 of the same table should be changed to "°K" (from DM).

The following SCAMS information has been edited by the experimenter and briefly outlines the current status of data availability, retrieval methods, and a current table of theoretical brightness temperature values.

The SCAMS instrument operated from June 15, 1975 to May 31, 1976. The data from this experiment has been processed and can be obtained from the National Space Science Data Center at GSFC. The digital data, including instrument output, calibrated antenna temperatures, deconvolved brightness temperatures, and retrieved atmospheric parameters, are recorded on a set of 87 9-track tapes. With three exceptions, each

tape contains four contiguous days of data. Channel 1 and 2 brightness temperatures and five atmospheric parameters from these tapes have been dumped in a condensed format on microfiche. A typical fiche contains somewhat less than two days of data. Photographic images for individual orbits are also available.

At this time, the archived data represent the "first cut" at retrievals, and can be improved with respect to calibration of the oxygen band channels and inversion of the H_2O channels. Data prior to January 2, 1976 was calibrated by assuming the radiometric temperatures of the calibration targets to be equal to their physical temperatures. Comparisons with radiosondes indicated that a more accurate calibration would be obtained with an offset of -1.2 K on the oxygen band target. The archived data starting with January 2, 1976 incorporates this correction. Strictly speaking, the previous data should be recalibrated and reinverted, but for most purposes an adequate approximation can be obtained by simply subtracting 1° from the oxygen band antenna and brightness temperatures and the retrieved temperature profile. No correction was made to the H_2O targets, for lack of evidence that any was necessary.

All of the archived water vapor and liquid water retrievals were obtained by a linear algorithm. Improved retrievals, particularly in humid regions, can be obtained by use of the following nonlinear equations:

$$\begin{aligned} \text{vapor} \quad &(\text{mm}) = 72 + 12\ \alpha \\ \text{liquid} \quad &(\text{mm}) - 0.4\ \beta \end{aligned}$$

where

$$\alpha = \left[7.34 \ln \left(\frac{280 - T_{01}}{280 - T_{B1}}\right) - 3.75 \ln \left(\frac{280 - T_{02}}{280 - T_{B2}}\right)\right] \cos \theta$$

$$\beta = \left[-3.34 \ln \left(\frac{280 - T_{01}}{280 - T_{B1}}\right) + 9.71 \ln \left(\frac{280 - T_{02}}{280 - T_{B2}}\right)\right] \cos \theta$$

T_{B1} and T_{B2} are the measured brightness temperatures at 22.23 and 31.65 GHz, and T_{01} and T_{02} are brightness temperatures computed for a tropical model atmosphere containing 72 mm precipitable water vapor; the latter are listed in Table 1 as a function of view angle θ.

The following information, describing how the antenna temperatures are computed from the SCAMS instrument digital data, should be added after SCAMS Section 4.5 of the User's Guide.

4.6 Post-launch Calibration

Antenna temperatures are computed from the SCAMS instrument digital data for each of the five channels by the equation:

Table 5-4

Theoretical brightness temperatures for a saturated tropical troposphere with no clouds and a smooth ocean surface (Valid for period 2 January 1976 - 31 May 1976)

θ view angle	T_{01}	T_{02}
0°	225.6	178.2
8°	225.9	177.9
17°	226.9	177.3
26°	229.2	177.5
34°	233.9	180.1
44°	242.0	187.4
53°	254.5	203.0

$$T_A = T_{AS} + \frac{T_{AC} - T_{AS}}{d_{T_c} - d_s}(d - d_s)$$

where T_A is antenna temperature for the earth (positions 0-12), T_{AS} is the space antenna temperature (position 13), T_{AC} is the calibration target antenna temperature (position 14), d is earth data in counts, d_s is space data in counts, and d_c is calibration target data in counts. The digital data matrix is described in Table 4-2 of the Nimbus 6 User's Guide. The space calibration antenna temperature is assumed constant at 3°K for all five channels. The target antenna temperature is computed by

$$T_{AC} = T_C + T_{CO}$$

The constant offset T_{CO} is currently zero for channels 1 and 2. The target temperatures (T_C) are given by

$$T_C = a_0 + a_1 (R - R_{25}) + a_2 (R - R_{25})^2$$

where the thermistor resistances (R) are computed by

$$R = R_1 + \frac{R_2 - R_1}{d_{R2} - d_{R1}} (d_R - d_{R1})$$

Table 5-5

This table accompanies Section 4.6 "Post-launch Calibration", and should be added to the end of the SCAMS section of the User's Guide

Table 4-9

Thermistor Calibration Constants
used to Calculate the SCAMS Target Temperatures

channel / constant	1	2	3,4,5
a_0	298.16		
a_1	.46485	.46535	.46814
a_2	$3.0 \cdot 10^{-5}$	$2.9 \cdot 10^{-5}$	$3.0 \cdot 10^{-5}$
R_{25}	603.75	602.98	599.71
R_1	495.6		
R_2	603.4		
d_R (word no.)	1	11	2
d_{R1} (word no.)	61		62
d_{R2} (word no.)	71		72

Table 5-6

This table replaces Table 4-9 in Section 4.6 "Post-launch Calibration" and should be added to the end of the SCAMS section of the User's Guide.

Table 4-9a

Thermistor Calibration Constants
used to Calculate the SCAMS Target Temperatures

channel / constant	1	2	3,4,5
a_0	298.16		
a_1	.46485	.46535	.46814
a_2	$3.0 \cdot 10^{-5}$	$2.9 \cdot 10^{-5}$	$3.0 \cdot 10^{-5}$
R_{25}	603.75	602.98	599.71
R_1	495.6		
R_2	603.4		
d_R (word no.)	1	11	2
d_{R1} (word no.)	61		62
d_{R2} (word no.)	71		72
T_{CO}	0		-1.2°K

and values of the other constants are listed in Table 4-9a. Note that channels 3, 4, and 5 share the same calibration target. Also listed in Table 4-9a are word numbers in the digital data matrix containing data values d_R, d_{R1}, d_{R2}, and the recent addition of the T_{CO} value for channels 3, 4, and 5.

5.4 ESMR Corrections to the User's Guide

The following are corrected equations for the ESMR Section of the User's Guide:

page 90

$$X\ (km) = (636 + 10.8P = 0.32P^2)\ R_j$$

page 96

$$T_B = T_A - (T_A - T_C)\ \frac{(C - C_A)}{(C_C - C_A)}$$

page 101

$$T_{\substack{\text{Horizontal} \\ \text{True}}} = 1 + a\ T_{\substack{\text{Horizontal} \\ \text{Nominal}}} - T_{\substack{\text{Vertical} \\ \text{Nominal}}}$$

$$T_{\substack{\text{Vertical} \\ \text{True}}} = 1 + b\ T_{\substack{\text{Vertical} \\ \text{Nominal}}} - b\ T_{\substack{\text{Horizontal} \\ \text{Nominal}}}$$

page 106

$$N_i = 256\ (T_{Hi} - 100) + T_{Vi} - 100$$

The following information supplements Section 5.3.2 in the User's Guide.

The display format and temperature ranges of the images in the swath displays for ESMR has been changed twice since launch. The first revision occurred after orbit 3932 in which each ESMR scan line is displayed once prior to orbit 3932 and twice after orbit 3933. Similarly, each of the 71 scan-spot elements is displayed once through orbit 3932 and twice after 3933.

Through orbit 3932 (31 March) the ESMR displays contained 20 swaths of data, as shown in the ESMR image displays up to orbit 3932 in Section 3.3. The swaths are numbered (numbers not shown) from 1 on the left to 20 on the right. Each of the ten swaths on the left has the same geographic coverage. However, each swath displays either horizontally or vertically polarized data at a temperature range as listed in Table 5-5a. The right set of ten swaths has a similar format, and displays the earliest recorded data. If the right swaths were cut and placed above the group on the left, the

new display would show the continuous coverage recorded for that orbit. Swaths 1 and 11 have the same polarization and temperature range. Similarly, swaths 2 and 12, 3 and 13, etc., are the same. The tables here labeled 5-8 and 5-9 replace Table 5-5 on page 105 of the User's Guide.

As stated above, the ESMR display format was modified at orbit 3933 (31 March 1976) and again at orbit 6185 (15 September 1976). From orbit 3933 through orbit 6184, the following format was used:

The new displays contain ten swaths of data plus a geographic grid overlay for each swath, as shown in the ESMR image displays after orbit 3933 in Section 3.3, of the Nimbus 6, Data Catalog, Volume 5.

The swaths are numbered (numbers not displayed) from 1 on the left to 10 on the right. Each of the five swaths on the left has the same geographic coverage. However, each swath displays either horizontally or vertically polarized data at a temperature range as listed in Table 5-5b. The right set of five swaths has a similar format, and displays the latest recorded data. If the right swaths were cut and placed below the group on the left, the new display would show the continuous coverage of that display.

Swaths 1 and 6 display the same parameter. That is, the temperature range and polarization for swaths 1 and 6 are the same. Similarly, swaths 2 and 7, 3 and 8, 4 and 9, and 5 and 10 display the same parameters. Table 5-5b is set up to show this duplication of parameter information.

Data time (GMT) references for the left set of five swaths are shown adjacent to the vertical line at the left. Time tick marks are every five minutes with hour and minute annotation every fifteen minutes. Data time references for the right set of five swaths are shown in a similar manner adjacent to the vertical line at the right.

The center portion of the display contains two swaths of grid overlay information: the left grid for overlay on each of the five swaths on the left, and the right grid for overlay on each of the five swaths on the right. The grid longitudes are generated for ten degree intervals between 55 degrees south and 55 degrees north, and at 20 degree intervals from 55 degrees to the Poles. Latitude grids are generated every five degrees. All grid lines consist of a series of dots at one degree intervals. Latitudes are labeled at 60°S, 30°S, EQ, 30°N, and 60°N. Longitude labels are normally placed next to each latitude label.

From orbit 6185 (15 September 1976) through the current data catalog period, the new ESMR image display has the following format:

Since an anomaly renders the Horizontal channel unuseable, the new ESMR format was devised to display the Vertical channel with five different temperature ranges and polarization for each individual swath. That is, the temperature range and polarization for swaths 1 and 6 are the same. Swaths 2 and 7, 3 and 8, 4 and 9, and 5 and

Table 5-7
This table replaces Table 5-5 on page 105 in the User's Guide

Table 5-5

Brightness Temperature Value for each Step of the Gray Scale on ESMR Image Displays for Orbits 426 through 827 (14 July through 12 August 1975)

Gray Scale Number		Swath Number and ESMR Display Parameter									
		1 and 11 (T_H)	2 and 12 (T_V)	3 and 13 $\frac{T_H+T_V}{2}$	4 and 14 (T_H)	5 and 15 (T_V)	6 and 16 $\frac{T_H+T_V}{2}$	7 and 17 (T_H)	8 and 18 (T_V)	9 and 19 $\frac{T_H+T_V}{2}$	10 and 20 (T_V-T_H)
(black)	1	> 200			> 250			> 300			> 50
	2	196-200	same	same	246-250	same	same	296-300	same	same	46-50
	3	193-196	as	as	243-246	as	as	293-296	as	as	43-46
	4	190-193	1 and 11	1 and 11	240-243	4 and 14	4 and 14	290-293	7 and 17	7 and 17	40-43
	5	187-190			237-240			287-290			37-40
	6	184-187			234-237			284-287			34-37
	7	181-184			231-234			281-284			31-34
	8	178-181			228-231			278-281			28-31
	9	175-178			225-228			275-278			25-28
	10	171-175			221-225			271-275			21-25
	11	168-171			218-221			268-271			18-21
	12	165-168			215-218			265-268			15-18
	13	162-165			212-215			262-265			12-15
	14	159-162			209-212			259-262			09-12
	15	156-159			206-209			256-259			06-09
	16	153-156			203-206			253-256			03-06
	17	150-153			200-203			250-253			00-03
(white)	18	< 150			< 200			< 250			< 00

T_H = Brightness temperature derived from the ESMR horizontal polarization channel data

T_V = Brightness temperature derived from the ESMR vertical polarization channel data

Table 5-8
This table follows the new Table 5-6 (above), which replaced
Table 5-5 on page 105 in the User's Guide

Table 5-5a

Brightness Temperature Value for each Step of the Gray Scale on ESMR Image Displays
for Orbits 828 through 3932 (13 August 1975 through 31 March 1976)
(Brightness Temperatures are in °K)

Gray Scale Number		Swath Number and ESMR Display Parameter									
		1 and 11 (T_H)	2 and 12 (T_V)	3 and 13 $\frac{T_H+T_V}{2}$	4 and 14 (T_H)	5 and 15 (T_V)	6 and 16 $\frac{T_H+T_V}{2}$	7 and 17 (T_H)	8 and 18 (T_V)	9 and 19 $\frac{T_H+T_V}{2}$	10 and 20 (T_V-0.6T_H)
(black)	1	> 200	> 230	> 210	> 250	> 270	> 250	> 290	> 300	> 280	> 140
	2	196-200	226-230	206-210	246-250	267-270	247-250	287-290	298-300	278-280	136-140
	3	191-196	223-226	203-206	243-246	264-267	244-247	284-287	295-298	275-278	133-136
	4	187-191	219-223	199-203	239-243	261-264	241-244	281-284	293-295	273-275	129-133
	5	183-187	215-219	195-199	235-239	258-261	238-241	278-281	290-293	270-273	125-129
	6	178-183	211-215	191-195	231-235	254-258	234-238	274-278	288-290	268-270	121-125
	7	174-178	208-211	188-191	228-231	251-254	231-234	271-274	285-288	265-268	118-121
	8	169-174	204-208	184-188	224-228	248-251	228-231	268-271	283-285	263-265	114-118
	9	165-169	200-204	180-184	220-224	245-248	225-228	265-268	280-283	260-263	110-114
	10	161-165	196-200	176-180	216-220	242-245	222-225	262-265	278-280	258-260	106-110
	11	156-161	193-196	173-176	213-216	239-242	219-222	259-262	275-278	255-258	103-106
	12	152-156	189-193	169-173	209-213	236-239	216-219	256-259	273-275	253-255	99-103
	13	148-152	185-189	165-169	205-209	233-236	213-216	253-256	270-273	250-253	95-99
	14	143-148	181-185	161-165	201-205	229-233	209-213	249-253	268-270	248-250	91-95
	15	139-143	178-181	158-161	198-201	226-229	206-209	246-249	265-268	245-248	88-91
	16	134-139	174-175	154-158	194-198	223-226	203-206	243-246	263-265	243-245	84-88
	17	130-134	170-174	150-154	190-194	220-223	200-203	240-243	260-263	240-243	80-84
(white)	18	< 130	< 170	< 150	< 190	< 220	< 200	< 240	< 260	< 260	< 80

T_H = Brightness temperature derived from the ESMR horizontal polarization data

T_V = Brightness temperature derived from the ESMR vertical polarization data

Table 5-9

This table follows the new Table 5-5a (above), which replaced Table 5-5 on page 105 in the User's Guide

Table 5-5b

Brightness Temperature Value for each Step of the Gray Scale on ESMR Image Displays for Orbits 3933 through 6184 (31 March through 15 September 1976)

(Brightness Temperatures are in °K)

Gray Scale Number	Swath Number and ESMR Display Parameter				
	1 and 6 (T_H)	2 and 7 (T_H)	3 and 8 (T_H)	4 and 9 (T_V)	5 and 10 $\left(\frac{T_H + T_V}{2}\right)$
(black) 1	>200	>230	>210	>250	>270
2	196-200	296-230	206-210	246-250	267-270
3	191-196	223-226	203-206	243-246	264-267
4	187-191	219-223	199-203	239-243	261-264
5	183-187	215-219	195-199	235-239	258-261
6	178-183	211-215	191-195	231-235	254-258
7	174-178	208-211	188-191	228-231	251-254
8	169-174	204-208	184-188	224-228	248-251
9	165-169	200-204	180-184	220-224	245-248
10	161-165	196-200	176-180	216-220	242-245
11	156-161	193-196	173-176	213-216	239-242
12	152-156	189-193	169-173	209-213	236-239
13	148-152	185-189	165-169	205-209	233-236
14	143-148	181-185	161-165	201-205	229-233
15	139-143	178-181	158-161	198-201	226-229
16	134-139	174-178	154-158	194-198	223-226
17	130-134	170-174	150-154	190-194	220-223
(white) 18	<130	<170	<150	<190	<220

T_H = Brightness temperature derived from the ESMR horizontal polarization data

T_V = Brightness temperature derived from the ESMR vertical polarization data

10 display the same parameters. Thus, four additional swaths of data are dedicated to the Vertical channel display for a total of 5 swaths as described above.

Data time (GMT) references and grid overlay information remain unchanged. Please refer to Table 5-10 for new parameter information.

5.5 ERB Corrections to the User's Guide

Post-launch calibration procedures are described below. While some numbers are for the period of this catalog, the calibration procedure is valid for all data. This information can be added as Section 6.5a to the User's Guide and would fit on page 134.

6.5a Post-launch Calibration

The observations from the wide angle channels (11 and 12), which measure the total energy (<0.2 μm to $>50\mu$m) emitted and reflected by the earth, depend on the prelaunch calibration and pertinent instrument temperatures. Assuming unit emissivity for the target scene, the irradiance from the scene is given by,

$$H_T = [\Delta W - \epsilon_s F_s \sigma T_s^4 + \epsilon_d F_d \sigma (T_d + K_v)^4]$$

where

ΔW = effective thermopile irradiance (w m^{-2})

σ = 5.6697 X 10^{-8} w m^{-2} (deg. K)$^{-4}$

ϵ_s = emissivity of FOV stop = 0.965

F_s = view factor of the FOV stop = 0.18892

T_s = temperature (°K) of the FOV stop

ϵ_d = emissivity of the thermopile = 0.977

F_d = view factor of the thermopile = 0.80461

T_d = temperature (°K) of the thermopile base

K = factor relating thermopile base temperature to thermopile surface temperature = 0.0031°K per count

v = thermopile output in digital counts

The effective thermopile irradiance (ΔW) is obtained from the thermopile output (v) as follows:

Table 5-10

Brightness Temperature Value for each Step of the Gray Scale on ESMR Image Displays for Orbits 6185 (15 September 1976) through the present Catalog period (Brightness Temperatures are in °K)

Gray Scale Number		Swath Number and ESMR Display Parameter				
		1 and 6 (T_V)	2 and 7 (T_V)	3 and 8 (T_V)	4 and 9 (T_V)	5 and 10 (T_V)
(black)	1	>240	>254	>270	>280	>300
	2	236-240	251-254	266-270	277-280	296-300
	3	233-236	248-251	263-266	274-277	293-296
	4	230-233	245-248	260-263	271-274	290-293
	5	227-230	242-245	257-260	268-271	287-290
	6	224-227	239-242	254-257	265-268	284-287
	7	221-224	236-239	251-254	262-265	281-284
	8	218-221	233-236	248-251	259-262	278-281
	9	215-218	230-233	245-248	256-259	275-278
	10	212-215	227-230	242-245	253-256	272-275
	11	209-212	224-227	239-242	250-253	269-272
	12	206-209	221-224	236-239	247-250	266-269
	13	203-206	218-221	233-236	244-247	263-266
	14	200-203	215-218	230-233	241-244	260-263
	15	197-200	212-215	227-230	239-241	257-260
	16	193-197	208-212	223-227	237-239	253-257
	17	190-193	205-208	220-223	235-237	250-253
(white)	18	<190	<205	<220	< 235	<250

T_V = Brightness temperature derived from the ESMR vertical polarization data

$$\Delta W = a_o (T_m) + a_1 (T_m) \cdot v$$

where

$$a_o = C_o + C_1 T_m ,$$

and

$$a_1 = d_o + d_1 T_m$$

are derived from prelaunch calibrations and depend on the module temperature (T_m, °C). The coefficients C_o, C_1, d_o, d_1 are given below. In calibrating channel 11 and channel 12 (W) with the FOV stop out, the quantity F_s in the equation for H_T is set to zero.

	Ch. 11	Ch. 12 (W)	Ch. 12 (N)
C_o:	9.86	10.4	8.38
C_1:	0.18353	0.23235	0.18483
d_o:	0.6042	0.6035	0.6014
d_1:	-8.254×10^{-4}	-6.109×10^{-4}	-5.879×10^{-4}

The observations from the other two wide-angle channels (13 and 14), which measure the shortwave radiation (0.2 μm to 4.0 μm), and (0.7 μm to 3.0 μm), are transformed to irradiance (H) by,

$$H = \frac{(V - V_o)}{S_T}$$

where V is the digital counts, V_o is the offset (in counts) observed from dark FOV's, and S_T is the sensitivity (w m^{-2} $count^{-1}$) obtained from the equation: $S_T + S_o (1+(0.01) \cdot (T-25) \cdot STC)$, where S_o is the sensitivity at 25°C, T is the detector temperature (°C), and STC is the sensitivity temperature coefficient (percent per degree C). These constants are given below:

Ch	V_o	S	STC
13	-41	2.004	0.04
14	-44	3.989	0.03

The interpretation of digital counts (V) from the shortwave scanning channels (15-18) gives the radiance (w m^{-2} sr^{-1}) of the scene (N_s) by,

$$N = \frac{(V - V_o)}{S_T}$$

where V_o is the offset (counts) obtained during views of the internal blackbody or space. The sensitivity S_T at temperature T (°C) is obtained using the equation for S_T described above, and the constants given below.

Ch	V_o	S	STC
15	-3	3.155	0.0
16	0	3.275	0.03
17	-1	3.116	-0.01
18	15	2.963	-0.05

A series of checks on the sensitivity of these channels, using the on-board diffuse target, indicated no noticeable degradation over the July-August period of operation.

The longwave scanning channels (19-22) have had numerous inflight calibrations which have remained essentially unchanged since 3 July. The calibration coefficients, a_0 and a_1 relate digital counts (V) to the scene radiance N (w m^{-2} sr^{-1}) as follows:

$$N_s = N_m + a_0 + a_1 \cdot V$$

where N_m is the radiance of the detector module. The radiance N_s is the actual radiance measured within the spectral limits of the filter (4.5 μm to 50 μm). The calibration coefficients, obtained from inflight calibrations on 3 July, are as follows:

Ch	a_0	a_1
19	-0.82	0.09583
20	-0.60	0.10535
21	-1.26	0.10168
22	-0.29	0.10338

The deviations of these calibration coefficients as derived from inflight calibrations from 29 July to 20 August are shown in Table 6-6a. The only change which indicates a need for updating the calibration coefficients is the change in the intercept of channel 20.

Periodic checks of the electronic gains of channels 1 through 14 have shown that the electronic gains have remained within 0.5 percent of the prelaunch values, with few exceptions. Table 6-6a shows the percentage of maximum deviation in the gain ratios (current/prelaunch) for the three steps in the calibration staircase voltage. The 6.5 percent change in the high-level gain of channel 2 and the gain changes in channels 6, 7, and 8 are believed to be caused by radio-frequency interference with the electronic calibration circuit and is neither a real change in the electronic gain nor nonlinearities of the channels.

Table 5-11

This table is part of the new Section 6.5a "Post-launch Calibration" to be added to the ERB section of the User's Guide

Table 6-6a

Stability of Calibration of the
ERB Longwave Scanning Channels
(between 29 July and 20 August 1975)

	Channel 19		Channel 20		Channel 21		Channel 22	
Date	Δa_o	Δa_1	Δa_o	Δa_1	Δa_o	Δa_1	Δa_o	Δa_1
7/29	-0.07	-0.4	1.12	0.5	-0.07	-0.4	0.36	-0.3
8/5	0.50	-0.3	1.22	0.1	0.08	-0.3	0.11	-0.2
8/8	0.68	-0.4	1.33	0.1	0.04	-0.2	-0.003	-0.1
8/12	-0.06	-0.2	0.74	-0.4	-0.09	-0.3	0.17	-0.2
8/17	0.69	-0.3	1.49	0.2	0.20	-0.3	0.16	-0.2
8/20	-0.22	-0.3	1.53	0.2	0.04	-0.2	0.13	-0.4

Δa_o = change in intercept (w m^{-2} sr^{-1})

$$= (a_o)_{current} - (a_o)_{7/3/75}$$

Δa_1 = change in slope (% w m^{-2} sr^{-1} ct^{-1})

$$= \frac{[(a_1)_{current} - (a_1)_{7/3/75}]}{(a_1)_{7/3/75}} \times 100$$

Table 5-12

This table is part of the new Section 6.5a "Post-launch Calibration" to be added to the ERB section of the User's Guide

Table 6-6b

Percentage Change of the Maximum Deviation in the Gain Ratio between Post-launch and Prelaunch Gain Values for ERB channels 1 through 14 (20 June and 17 August 1975)

Ch	G_{0-39}	G_{30-60}	G_{60-90}
1	-0.2	0.2	-0.1
2	0.1	-0.3	-6.5
3	±0.1	-0.1	-0.2
4	±0.1	-0.2	-0.1
5	±0.1	-0.2	0.2
6	2.6	1.8	-2.1
7	1.3	2.1	-0.6
8	1.6	1.3	-0.9
9	0.4	-0.6	±0.1
10	0.7	-0.5	±0.2
11	-0.4	0.3	0.4
12	0.2	-0.2	0.4
13	-0.3	0.2	0.3
14	+0.2	-0.1	0.3

Table 6-7, the ERB Compacted Archival Tape Format, on pages 136 through 139 of the User's Guide, should be changed as follows:

Directory Record (Page 136)

Delete last line of section A which reads:

"135-340	Zero fill	1"

and add the following:

135-149	Orbital Elements	
135	Day of Epoch	1
136	Year of Epoch	1
137	Hours	1
138	Minutes (including fraction)	100
139	Eccentricity	10^5
140	Argument of Perigee (integer part)	1
141	Argument of Perigee (fraction part)	10^3
142	Right Ascension (integer part)	1
143	Right Ascension (fraction part)	10^3
144	Inclination (integer part)	1
145	Inclination (fraction part)	10^3
146	Semimajor Axis (km, integer part)	1
147	Semimajor Axis (km, fraction part)	10^3
148	Mean Anomaly (integer part)	1
149	Mean Anomaly (fraction part)	10^3
150	Sun-Earth Distance (A. U.)	10^4
151-340	Zero fill	1

Orbital Summary Record (Page 139)

Delete last line of table, which reads:

17-340	Zero fill	1"

and add the following:

17-26	Solar Irradiances (Chs. 1-10) Normalized to mean sun-earth distance	Chs. 1-5:10 Chs. 6-10:100
27	Solar Channels Assembly Gamma Angle (positive to right of track)	1
28-340	Zero fill	1

5.6 LRIR Corrections to the User's Guide

Table 5-13

Post-launch analysis of relative spectral response data and orbital data leads to the following corrected values for Table 7-2, on page 154 of the User's Guide

Table 7-2

Optical Characteristics of LRIR Channels

Channel		Band Pass (50% Peak Response)	Field-of-view (km)		Random noise in orbit* $\pm 1\sigma$(watts/m^2-sr)
No.	Abbrev.		Vertical	Horizontal	
1	NCO_2	649-672 cm^{-1} (14.9-15.4 μm)	2.0	20	0.0023
2	BCO_2	592-700 cm^{-1} (14.3-16.9 μm)	2.0	20	0.0040
3	O_3	984-1169 cm^{-1} (8.6-10.2 μm)	2.0	20	0.011
4	H_2O	412-446 cm^{-1} (22.4-24.3 μm)	2.5	25	0.008

*Noise will gradually increase as the detector temperature increases during the useful life of the experiment.

5.7 PMR Corrections to the User's Guide

There are no PMR corrections to the User's Guide.

5.8 TWERLE Corrections to the User's Guide

Table 5-14

The following are address changes to Table 9-2 on page 186 in the User's Guide

Table 9-2

Nimbus RAMS Experiments - Address Changes

Address Changes

OLD	NEW
Mr. G. R. Cresswell Division of Fisheries & Oceanography Commonwealth Scientific & Industrial Research Organization Melbourne, Australia	Mr. G. R. Cresswell Division of Fisheries & Oceanography CSIRO P. O. Box 21 Cronulla, N. S. W. 2230 Australia
A. J. Dyer CSIRO P. O. Box 77 Mordialloc, Vic 3195 Australia	Dr. A. J. Dyer Division of Atmospheric Physics CSIRO Station Street ASPENDALE 3195 Victoria, Australia
Professor Pierre Lacombe, Director Laboratory d'Oceanographic Museau Historie Naturelle de Paris 43 Rue Cuvier Paris, France	Professor Pierre Lacombe, Director Laboratoire d'Oceanographie Physique Museum National d'Histoire Naturelle 43-45 Rue Cuvier 75005 Paris, France
Professor P. Tchernia Museum d'Historie Naturelle de Paris 43 Rue Cuvier Paris, France	Professor P. Tchernia Laboratoire d'Oceanographie Physique Museum National d'Histoire Naturelle 43-45 Rue Cuvier 75005 Paris, France

Table 9-2 (Continued)

Dr. Norbert Untersteiner, Program Director Project AIDJEX 4059 Roosevelt Wave, N. E. Seattle, WA 98105	Dr. Norbert Untersteiner AIDJEX Coordinator University of Washington 4059 Roosevelt Way, N. E. Seattle, Washington 98105
Dr. Donald V. Hansen, Director Physical Oceanography AOWL NOAA U. S. Department of Commerce Miami, Florida	Dr. Donald V. Hansen, Director Physical Oceanography Laboratory AOML/NOAA 15 Rickenbacker Causeway Virginia Key Miami, Florida 33149
Vincent E. Lally National Center for Atmospheric Research P. O. Box 1470 Boulder, Colordao 80302	Mr. Vincent E. Lally National Center for Atmospheric Research P. O. Box 3000 Boulder, Colorado 80302
J. Lentfer Wildlife Research U. S. Department of Interior 813 D. Street Anchorage, Alaska	Mr. Jack W. Lentfer Fish and Wildlife Service Department of Interior 4454 Business Park Blvd. Anchorage, Alaska 99503
H. Brann Bureau of Meteorology Melbourne, Victoria Australia	Mr. H. N. Brann Bureau of Meteorology P. O. Box 1289K Melbourne, Victoria 3001 Australia
Robert Kee Development Engineering Division Code 6201 U. S. Naval Oceanographic Office Washington, D. C. 20390	Mr. Robert Kee Code 6220 U. S. Naval Oceanographic Office Washington, D. C. 20373

Table 9-2 (Concluded)

F. Anderson South African Council for Scientific & Industrial Research Congella, Natal, South Africa	Mr. Frank P. Anderson CSIR, Institute for Technology P. O. Box 17001 Congella 4013 South Africa
H. Stommel Professor of Oceanography MIT Cambridge, Massachusetts	Professor Henry Stommel Department of Meteorology Room 54-1416 Massachusetts Institute of Technology Cambridge, Massachusetts 02139
B. Buck Polar Research Lab. Santa Barbara California 93101	Mr. B. M. Buck, President Polar Research Laboratory, Inc. 123 Santa Barbara Street Santa Barbara, California 93101
John A. Knauss Graduate School of Oceanography University of Rhode Island Kingston, Rhode Island 02881	Dr. P. L. Richardson Woods Hole Ocean Institute Woods Hole, Massachusetts 02543

5.9 T&DRE Corrections to the User's Guide

There are no T&DRE corrections to the User's Guide.

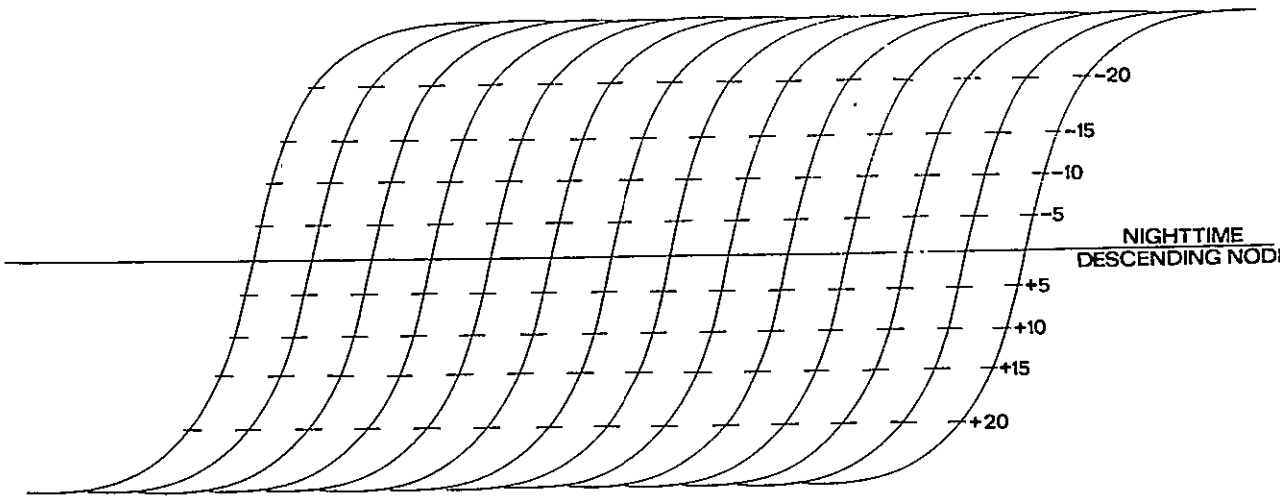
Table 5-15

The following are new TWERLE users, added since launch.
This information should be added to Table 9-2
(Nimbus RAMS Experiments) on page 186 in the User's Guide.

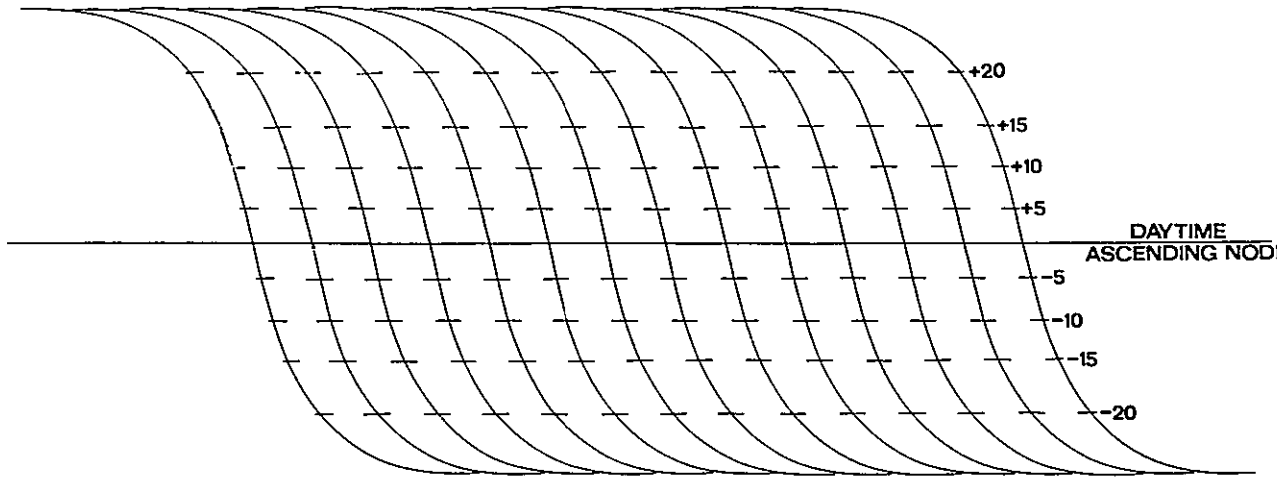
Principal Investigator	Experiment Title	Platform		
		Number	Type	Deployment Area
Dr. A. D. Kirwan, Jr. Department of Oceanography College of Geosciences Texas A & M University College Station, Texas 77843	Anomaly Dynamics Study (ADS)	32	Drifting Buoys	North Pacific
Mr. David F. Thomas, Jr. SATD-MEB-SDS, Mail Stop 322 NASA Langley Research Center Hampton, Virginia 23665	Air-droppable In Situ Platforms for Long Duration Measurements near Hurricanes	10	Ocean Platforms	Western Atlantic near North America
Dr. P. Roger Williamson Department of Applied Physics & Information Science University of California – San Diego La Jolla, California 92037	Stratospheric Monitoring with Longterm Balloon Flights	3	Super-pressure Balloons	Southern Hemisphere
Mr. J. C. O'Rourke Canadian Marine Drilling Ltd. P. O. Box 200 Calgary, Canada T2P 2H8	Arctic Ice Dynamics	2-4	Sea Ice Platforms	Beaufort Sea
Dr. J. Michael Hall NOAA Data Buoy Office National Space Tech Office Bay St. Louis, Mississippi 39520	East Coast Drifting Experiment	24	Drifting Buoys	Atlantic Ocean
	High Impact Detection and Determination on Large Buoys	10	Buoy	Atlantic Ocean, Gulf of Mexico, & North Pacific Ocean
	Reliability Enhancement Experiment	3	Buoy	Santa Barbara, California & Arctic Ocean
Mr. Robert Oehlkers University of Wisconsin Space Science and Engineering Center 1225 W. Dayton St. Madison, Wisconsin 53706	Buoy Experiments in Lake Michigan	10	Buoy	Lake Michigan

Table 5-15 (Continued)

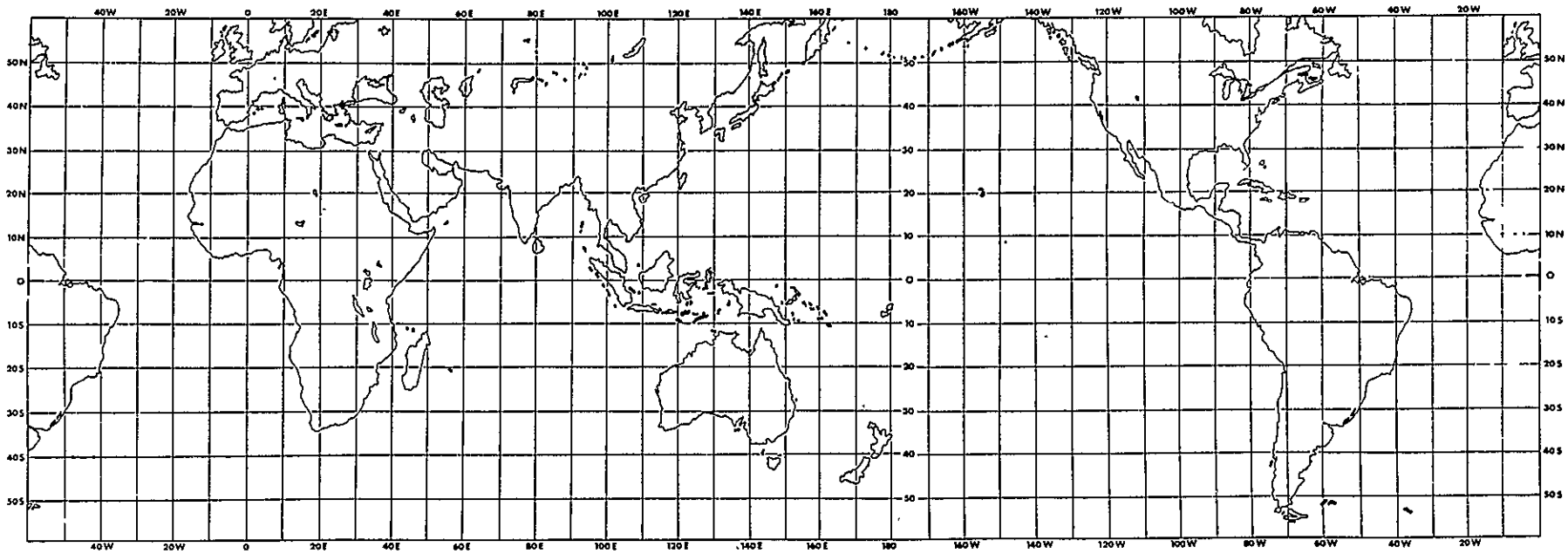
Capt. E. A. Delaney USCG Oceanographic Unit Bldg. 159E Navy Yard Navy Yard Annex Washington, D.C. 20590	North Atlantic and Labrador Current Studies	1	Drifting Buoys	North Atlantic, Labrador Coast
Dr. R. H. Goodman Innovative Ventures, Ltd. 4632 11th St. Calgary Alberta, Canada T2E2W7	Ice Monitoring in the Canadian Arctic and Labrador Region	2	Drifting Buoys	Canadian Arctic, Labrador
Dr. D. Halpern NOAA Pacific Marine Env. Labs. Univ. Washington WB10 Seattle, Washington 98195	Ocean Circulation Studies and Pacific Equatorial Waters	3	Drifting Buoys, Moored Buoys	Mid-Pacific Equatorial



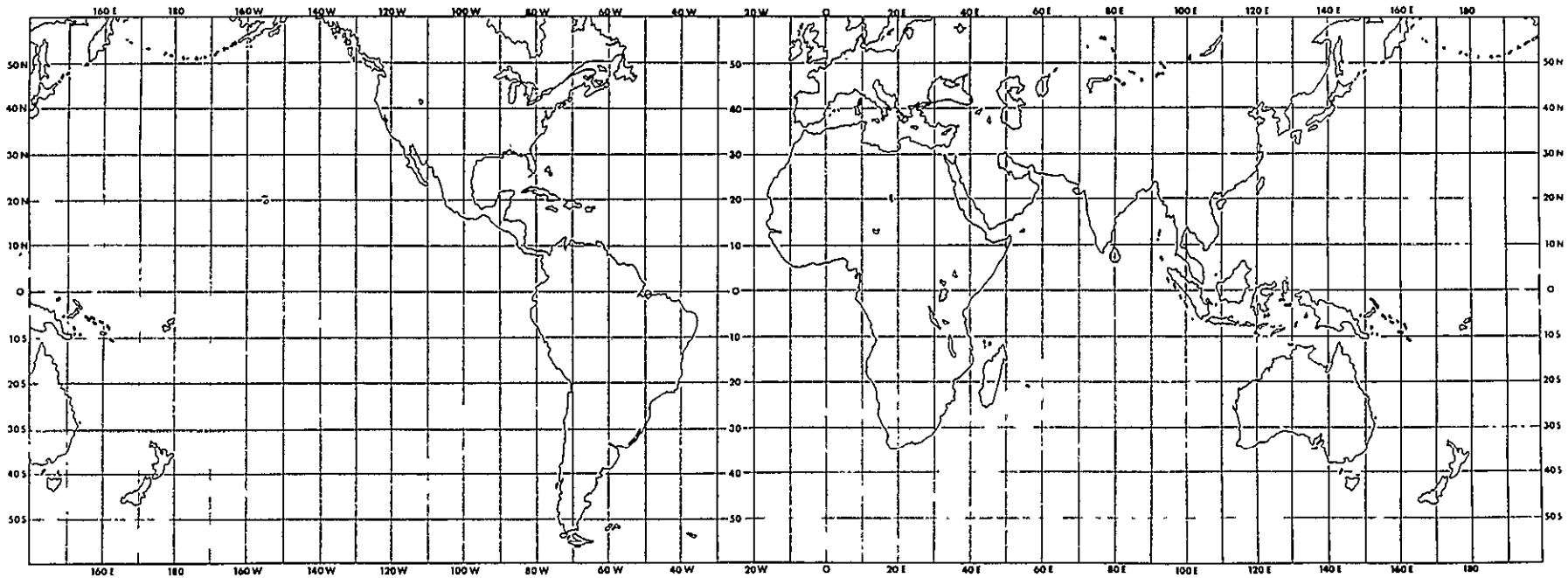
NIMBUS SUBSATELLITE TRACKS OVERLAY



NIMBUS SUBSATELLITE TRACKS OVERLAY



LOCATION GUIDE
AVERAGE SCALE FOR NIMBUS
THIR NIGHTTIME MONTAGES



Location Guide
Average Scale for Nimbus
THIR Daytime Montages